

The Iron Age

INDEX TO
READING MATTER
PAGE 32.

A Review of the Hardware, Iron and Metal Trades.

INDEX TO
ADVERTISEMENTS
PAGE 19.

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The Iron Ores of Elba.*

The island of Elba, which at the end of the last century belonged to the princes of Piombino, was finally ceded to Napoleon I in 1802. By the treaty of Vienna in 1815 the island reverted to the Tuscan Grand Ducal Government, by whom the mines were worked till 1851. In that year, the Government having contracted a loan of 10,080,000 lire with the firm of Bastogi, of Leghorn, a joint-stock company was formed, under which the mines were to be worked for 30 years—viz., from 1851 to 1881. In the meantime, with the union of Italy, the mines of Elba became the property of the State; and when, on June 30, 1881, the concession came to an end, the mines, together with the foundries of Follonica, Cecina and Valpiano, were leased to a group of capitalists represented by the General Bank of Italy. The new concession was made for three years, dating from July 1, 1881, the lessees paying a royalty of 5 lire 60 c. per ton of ore exported from Elba and the neighboring island of Giglio. The maximum annual output was not to exceed 200,000 tons. Up to 1870 the exports had never exceeded 95,000 tons in any single year, but during the last 15 years of the late concession they had averaged 173,000 tons annually, until in 1881 the output reached 403,215 tons, representing an official value of 4,395,043 lire. It has been the desire of successive Italian administrators, dating from the time of Cavour, to make Italy self-dependent as regards war material, and so far back as 1864 a project was laid before the Chambers for the erection of iron and steel works on an extensive scale in connection with these mines. The scheme, however, fell flat on the House, and a change of ministry caused it to be temporarily shelved.

In 1876 a committee appointed to inquire into the matter reported that to erect works capable of supplying the then requirements of the Government establishments would necessitate an outlay of over 100,000,000 lire (£400,000). In 1878 grave doubt arose as to the amount of ore existing in the Elba mines, and it was calculated that if the annual output was to be maintained at the rate of 1881—viz., 400,000 tons—the mines would be exhausted in 30 years. From various causes the project has up to the present remained in suspense, but Her Majesty's consul at Leghorn states that there is reason to believe that it "continues to occupy the attention of the Government, and it is evident that the brief duration of the existing lease and the limitation of the quantity of ore to be mined were dictated by a natural desire on the part of the Government not to diminish the deposits of ore materially, nor to pledge the mines too far ahead, pending a decision as to the erection of steel works." Signor Fabri, the Government inspector of mines, writing on this subject in 1880, pointed out some of the difficulties with which it is beset. They are the necessity of importing coal fuel from abroad; the great outlay required to erect works in connection with mines which are within a measurable distance of extinction; it being estimated that a yield of ore sufficient to produce 56,000 tons annually would exhaust them in 50 years; and, lastly, a probable gradual rise in price of Elba ore, so that the works would have small advantage over foreign furnaces, while the argument on which much stress has been laid, viz., of compensating the greater cost of fuel by the extremely low price of the ore and cheaper labor, would partly fall to the ground.

It appears, however, that since the date of the above report fresh surveys have been held, and it has been estimated that the deposits still existing above the sea level exceed 7,000,000 tons. Some, however, judge that the total quantity will prove to be much larger, and 10,000,000 to 12,000,000 have been stated as approximate figures. It appears also that along the shore under water, in the vicinity of Rio Marina, there exist very large accumulations of iron ore in fine sand or particles of a micaceous character. Her Majesty's consul at Leghorn states that of late years the price of Elban ore has not averaged more than 8 to 9 lire per ton, but, owing to unexpired contracts for French furnaces at 13 lire 75 c. per ton, the mines have yielded a handsome return, notwithstanding prevailing depression, and in 1873-74 they produced a net income of 2,600,000 lire. During the year 1883 freights to England for ore loaded at Rio (Elba) averaged 5/, and to North America 8/ per ton. Of magnaniferous ore the exports from the mines of Monte Argentario, near Orbetello, were 16,468 tons in 1883, against 24,737 tons in 1882 and 33,154 tons in 1881.

Notwithstanding the clearly apparent deficiency of the Patent Office management, so far as knowledge of what has been accomplished in the past is concerned, little, if anything, has been done to bring about a more satisfactory state of things. Complaints are frequent that patents are constantly being granted for old devices which have been known for years, and some of which have even been shown to be impracticable and almost valueless. The fact that these are again brought out as novelties is suggestive, and points to an evident lack of proper facilities in the Patent Office or of proper supervision of the work. In either case remedies should not be difficult to find.

* From the statistical report for 1885 of the secretary of the British Iron Trade Association.

With proper records—not the present official records alone, but records of progress and experiments not marked by applications for patents—the annual list of new inventions would be measurably reduced in length, many objectionable features of the present system would be eliminated and greater satisfaction to all concerned would be the result. It has been conclusively demonstrated on many occasions that some action in this matter is imperative, and we trust that its importance will soon be duly recognized.

Edward Frith.

The late Edward Frith, prominent in the English steel trade, whose sudden death in this city we announced in these columns a fortnight ago, was a merchant who needs no encomium. It would be sufficient to say, in

ing the career of the deceased merchant is the memorable case of alleged undervaluation by manufacturers and importers of English steel which agitated New York and Sheffield in the year 1870. Mr. Frith at that time, as representative of Sanderson Bros., of Sheffield, was among the chief defendants. In rebutting the charge, this firm and those associated in the trade were triumphantly vindicated. The result was of the utmost importance to steel manufacturers both in the United States and England, the controversy which preceded it having exerted a most prejudicial effect upon the British importing interests. The American consul at Sheffield charged that the manufacturers were invoicing steel to their agents in America at less prices than they were selling it for in English and European markets, and that consequently the merchandise referred to did not pay its

position he retained to the last, and in which he is succeeded by his son, Louis E. Frith, a gentleman favorably known. The funeral of Mr. Frith took place from St. Ann's Roman Catholic Church, Mgr. T. J. Preston performing the services. The pall bearers were Jacob D. Vermilye, president of the Merchants' National Bank; D. A. McTavish, manager of the Bank of British North America; Richard Patrick, Jules E. Brugiere, Henry Meyer and Wm. Von Sachs.

Open-Hearth Steel in Great Britain.

In the years between 1873 and 1880 there was a growth in the quantity of open-hearth steel made in Great Britain, varying (one year being excluded) from 2 per cent. to 45 per cent., the years 1876 and 1880 being those of most rapid advance. At the end of

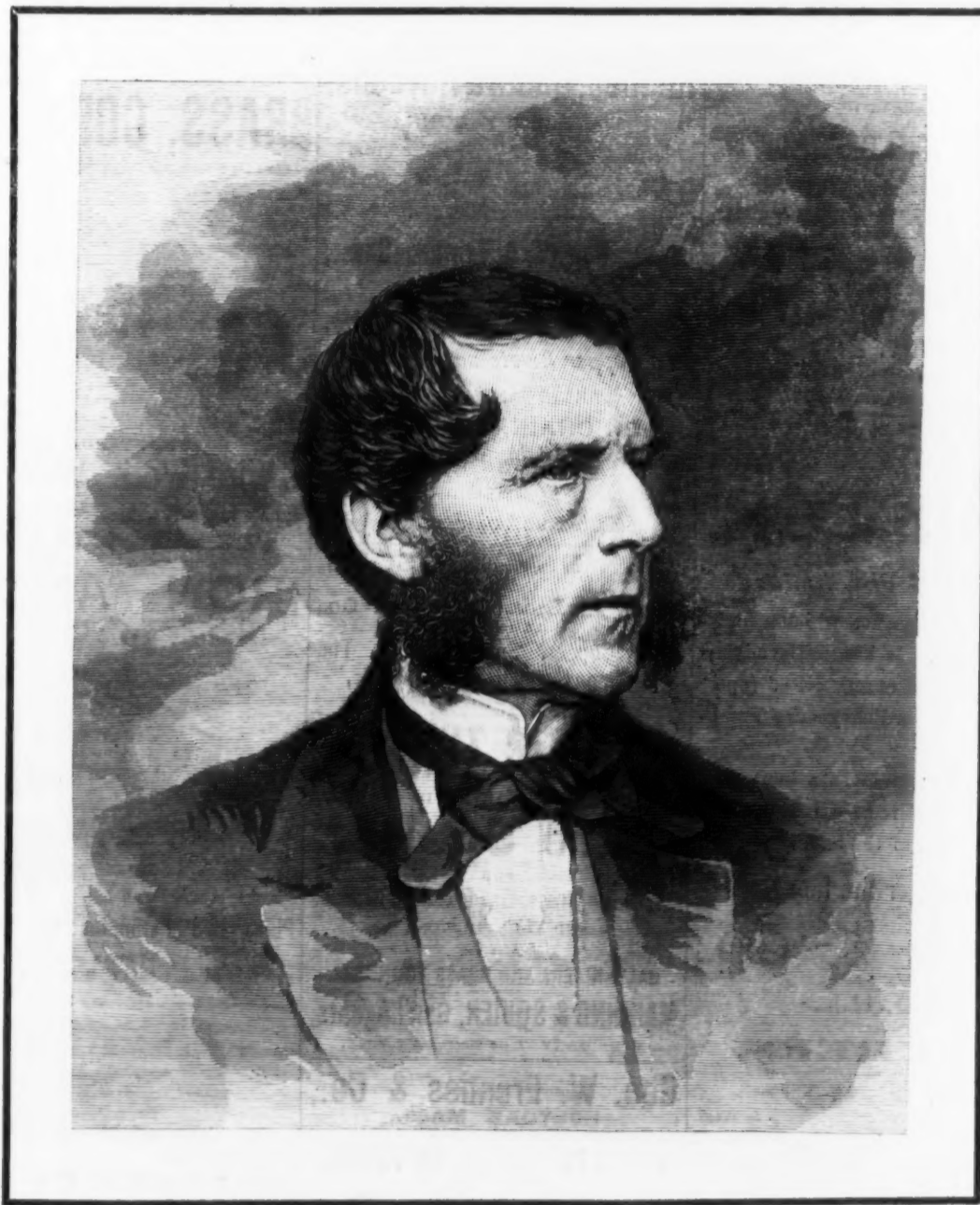
increase—an increase that approached the tripling of the production of the United Kingdom. Scotland contributed the largest portion to that increase—a fact that ought to be kept in mind, as showing the source of the growth, and shadowing forth the industry which caused it. South Wales had a large growth, but one far from proportionate with the north of the Tweed, Sheffield doubled its production, the northwest more than maintained the rate of increase, the small yield of the northeast shot up, and that in other districts also rose. It may be added, however, that the more regular working of the furnaces contributed to the enlargement of the production, for the average yield of each rose from 2540 tons in the year 1880 to 3114 tons for the year 1882. In the past three years the production of open-hearth steel in the United Kingdom has steadily, but slowly, advanced. Repeating the figures for the year above given, and adding those for the past two years, we have the following comparison, which completes the accumulated data of production:

Year.	Tons.	Year.	Tons.
1882.....	436,000	1884.....	461,965
1883.....	455,500		

This is not a rate of growth, it will be at once seen, equal to that in the years we have just compared, but it must be remembered that in the same interval we have not been able to maintain our production of Bessemer steel, which began to fall off in the year 1882. And it is tolerably certain that in the current year there will be a large addition to the open-hearth steel growth—an addition to which Scotland and the northeast coast will especially contribute. In the latter center, as we have seen, the output was very small so late as the year 1882, and it is since that time that arrangements have been completed for the production of larger quantities. The Consett Iron Company have established a reputation for the manufacture of open-hearth steel plates as they had years before done for iron plates; at Eston the production has this year been practically begun, as well as at Tudhoe, and it is expected that the Tyne will contribute more during the current year, while next year that production should further grow. It is certain that the material is more in demand for shipbuilding; the Clyde has now works that will yield large quantities for its own and other shipyards, and the builders of the northeast find that they cannot afford to neglect the production of this class of metal. Thus the growth of the past is being maintained in the districts that may be said to have made the early history of the open-hearth steel trade, while other great shipbuilding centers are now adding further facilities for production, which will in the future increase the yield and possibly tend toward a reduction of the price, for it is the relation and price of steel plates to iron plates which largely determines the use.

One of our contemporaries, the *American Architect*, some time ago called attention to the general admission by geologists that all coal beds once formed the bottoms of lakes of fresh or salt water, and it is thought that this fact indicates an explanation of the production of coal which will remove the difficulties of the old theory. It is hardly conceivable that wood, especially through the loss of its hydrogen, should ever become converted into a substance plastic enough to flow like a river, taking the impression of objects along its banks; but it is not difficult or unreasonable to suppose instead of this, that the stagnant lakes of the coal districts were, ages ago, when the temperature of the earth was higher and vegetation more luxuriant than now, filled with little plants which even now sometimes discolor our drinking water, and that these, dying and settling to the bottom, may in time have so accumulated as to form a layer of carbonaceous mud of considerable depth. Something of the kind still goes on in such ponds, the bottoms of which are usually covered with a light, black mud, while the bubbles of carburated or phosphured hydrogen which rise when this mud is stirred show that it is in process of conversion into something at least very similar to coal. Such mud, if it could be supposed to accumulate undisturbed, would present, perhaps, all the qualities necessary to fit it for conversion by decomposition into coal. The presence of certain salts and mineral substances which are often found in coal ashes, but never in wood, might be due, on this theory, to impurities dissolved or suspended in the water of the carboniferous lake, and even the formation of petroleum, naphtha and bitumen, in connection with coal, is at least as easily explained by this hypothesis as by the old one.

A number of years ago Prof. Charles B. Richards, the inventor of the indicator bearing his name, while superintendent of Colt's (revolver) Armory, at Hartford, Conn., devised an electric alarm for hot bearings which was applied to the journals on the shafting. By the use of a compound bar of brass and steel an electric circuit connecting to an annunciator in the engine-room was closed and rung an alarm bell and also displayed a numbered tag indicating the line of shafting where the heating occurred. As it was seen several years ago, some of the details may not be precisely related, but the general fact of using the expansion of metals to give warning of heated bearings before cutting occurs is as stated.



EDWARD FRITH.

offering a tribute to his memory, that throughout a long and active business career he maintained an unblemished reputation; that his name was a synonym for mercantile honor and probity, and, withal, that he possessed in an eminent degree those gentle and kindly characteristics which as naturally find expression in the business intercourse of each day as in the amenities of social life. To speak of these qualities in elaborate detail, or to illustrate by an array of personal incident selected from the routine of daily life, would be at best a perfunctory service. His life work is finished, his duty done, the record closed. Let it suffice to repeat the testimony of another, in referring to some passing event with which Mr. Frith was identified, that he exhibited in his own person a singular illustration of the compatibility of gentlemanly polish, literary culture and delicate natural instincts, with well-defined common sense and practical business capacity. As another among surviving friends sentimentally observes, he "carried his face on his sleeve." If business generally was governed by a like disposition—so considerate and yet so sternly just—a large part of the annoyances and difficulties which harass the man of business would wholly cease.

Speaking more particularly, then, of events rather than of moral qualities or personal characteristics, the single occurrence above all others which challenges attention in trac-

proper dutiable value. The custom-house appraisers raised these goods still higher in the scale of valuation, and their action was confirmed by the collector of the port and the United States District Attorney. The result was that for some months there was almost a deadlock in steel importations. Then followed an appeal on behalf of 57 merchants before the general appraiser. Finally, a special commission of "merchant appraisers" was appointed by Collector Grinnell to visit Sheffield and investigate all questions in dispute and report to the United States Treasurer. Suffice it to say Secretary Boutwell wrote respecting the report of the commissioners, among whom was Mr. A. S. Hewitt: "These gentlemen have made a very thorough investigation into the matter, and their report, which has been prepared with great care, fails to reveal any evidence of attempted fraud by these manufacturers in their invoices of steel heretofore sent by them to this country."

As stated by us in a former article, Mr. Edward Frith came to this country in the year 1832, as agent of Wm. Greaves & Co., manufacturers of cutlery in Sheffield, and in 1841 assumed the practical conduct of the business of Sanderson Bros., referred to in Dr. Lardner's encyclopedia as "the most extensive and celebrated steel works in the world." In 1879 he became agent for Benjamin Atha & Co., of Newark, N. J., which

the last-named year there were 126 open-hearth furnaces erected in the United Kingdom, and it may be interesting to state the localities. South Wales stood at the head of the list with 49 furnaces, Scotland followed with 36, Sheffield with 19, Lancashire and Cheshire with 14, the northeast coast had only 5, and there were 3 in other districts. In the years 1881 and 1882 there was a large development in the production of this class of steel, and, while at the end of the year 1879 the total production of the kingdom had risen to 175,000 tons, it shot up by the end of the year 1882 to 436,000 tons. It was between these two years, says *Engineering*, that the most rapid growth was known, and it will be, therefore, interesting to trace from the records of the British Iron Trade Association the growth in the different districts. The amount of the open-hearth steel produced was, for the two years named below, as follows for the contributory districts of the United Kingdom:

	1879 Tons.	1882 Tons.
Scotland.....	50,000	213,000
South Wales.....	85,000	120,500
Sheffield.....	21,000	42,000
Northwest.....	15,000	32,500
Northeast.....	1,000	6,000
Other districts.....	3,000	12,000
Total.....	175,000	436,000

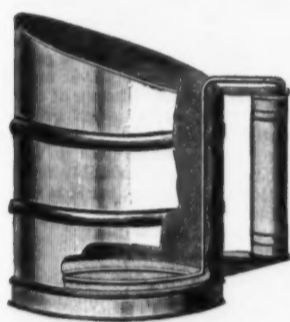
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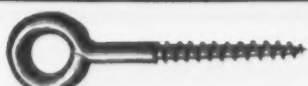
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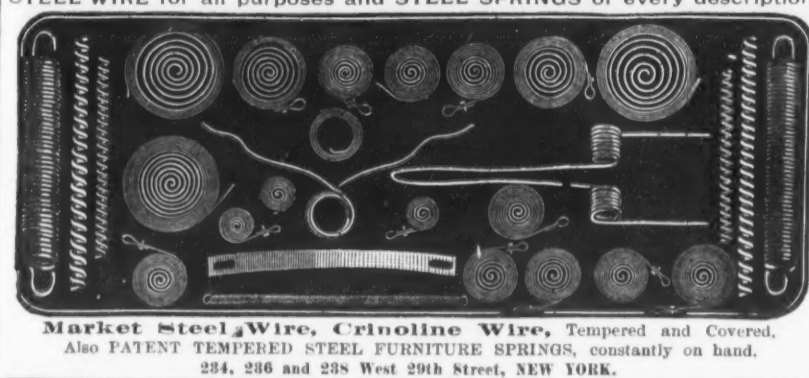
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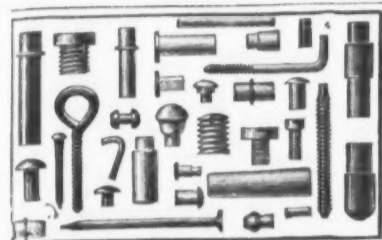
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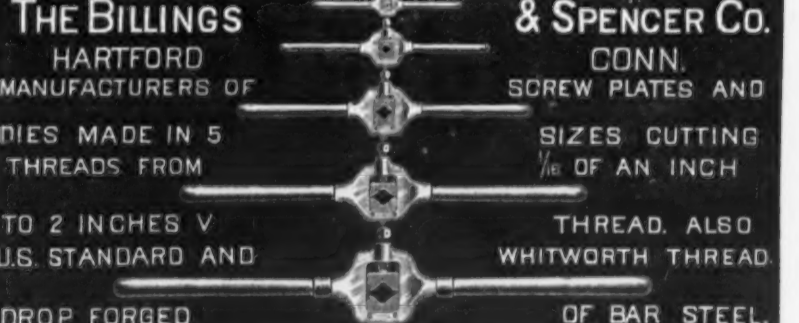
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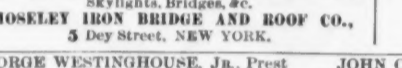
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A Standard Method of Steam-Boiler Trials.

In our issue of December 25, 1884, we com-
menced the publication of the report of the
committee on "A Standard Method of
Steam Boiler Trials," appointed some time
ago by the American Society of Mechanical
Engineers. As some changes, however,
were subsequently contemplated in portions
not yet published by us, we thought it well,
and so stated it at the time, to postpone fur-
ther proceeding in this matter until we could
obtain the report in definite form. As it
has now been issued, we are enabled to con-
tinue from the point at which we left off.

In concluding its prefatory remarks the
committee, which consists of Messrs. J. C.
Hendley, Chas. T. Porter, Chas. E. Emery,
Wm. Kent and Prof. R. H. Thurston, says:

"It is the opinion of this committee that
a boiler rated at any stated number of horse-
powers should be capable of developing that
power with easy firing, moderate draft and
ordinary fuel, while exhibiting good econ-
omy; and, further, that the boiler should
be capable of developing at least one-third
more than its rated power to meet emer-
gencies at times when maximum economy is
not the most important object to be at-
tained. Any increase of temperature de-
rived from a feed-water heater acted upon
by the products of combustion escaping from
a boiler should not be credited to the evapo-
rative efficiency of the boiler, except by
agreement; and in the latter case accurate
tests can be made only with feed-water of
the average temperature used during the
regular operation of the boiler. The code
presented by your committee is necessarily,
as has been already indicated, condensed to
the utmost possible extent consistent with
exactness and essential completeness. In
matters of detail it must be left to the en-
gineer to carry out the evident spirit and
intent of the code by devising his own
methods, and it may be expected that every
engineer will be competent to supplement
the directions here given, as far as is neces-
sary. In order, however, to exhibit the
extent to which he may work up such de-
tails, and to present the views of the mem-
bers of the committee more fully, both in
matters in which they agree and in those in
which differences of views exist, an appendix
is added to the report, in which memoranda
written out by them are given describing
details of work more fully than they are
given in the code, and expressing individual
opinions in regard to such matters as have
seemed to each of such importance as to
demand special notice. Each of these notes
is signed with the initials of the writer."

CODE OF RULES FOR BOILER TESTS.

PRELIMINARIES TO A TEST.

I. In preparing for and conducting trials
of steam boilers the specific object of the pro-
posed trial should be clearly defined and
steadily kept in view.

II. Measure and record the dimensions,
position, &c., of grate and heating surfaces,
flues and chimneys, proportion of air space
in the grate surface, kind of draft, natural
or forced.

III. Put the boiler in good condition; have
heating surface clean inside and out, grate-
bars and sides of furnace free from clinkers,
dust and ashes removed from back connec-
tions, leaks in masonry stopped and all
obstructions to draft removed. See that the
damper will open to full extent, and that it
may be closed when desired. Test for leaks
in masonry by firing a little smoky fuel and
immediately closing damper. The smoke
will then escape through the leaks.

IV. Have an understanding with the parties
in whose interest the test is to be made as
to the character of the coal to be used. The
coal must be dry, or, if wet, a sample must
be dried carefully and a determination of
the amount of moisture in the coal made,
and the calculation of the results of the test
corrected accordingly.

Wherever possible, the test should be
made with standard coal of a known quality.
For that portion of the country east of the
Allegheny Mountains good anthracite egg
coal, or Cumberland semi-bituminous coal,
may be taken as the standard for making
tests. West of the Allegheny Mountains
and east of the Missouri River, Pittsburgh
lump coal may be used. (These coals are
selected because they are about the only
coals which contain the essentials of excel-
lence of quality, adaptability to various kinds
of furnaces, grates, boilers and methods of
firing, and wide distribution and general
accessibility in the markets.)

V. In all important tests a sample of coal
should be selected for chemical analysis.

VI. Establish the correctness of all ap-
paratus used in the test for weighing
and measuring. These are: 1. Scales for
weighing coal, ashes and water. 2. Tanks
or water meters for measuring water. Water
meters, as a rule, should only be used as a
check on other measurements. For accurate
work the water should be weighed or mea-
sured in a tank.

3. Thermometers and pyrometers for taking
temperatures of air, steam, feed-water,
waste gases, &c. 4. Pressure gauges, draft
gauges, &c.

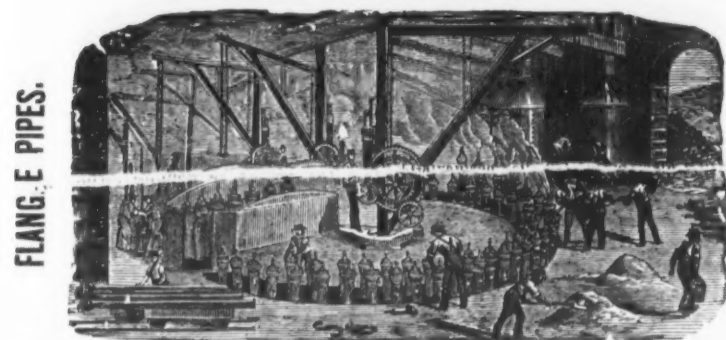
VII. Before beginning a test the boiler
and chimney should be thoroughly heated to
their usual working temperature. If the
boiler is new it should be in continuous use
at least a week before testing, so as to
dry the mortar thoroughly and heat the
walls.

VIII. Before beginning a test the boiler
and connections should be free from leaks,
and all water connections, including blow
and extra feed pipes, should be disconnected
or stopped with blank flanges, except the
particular pipe through which water is to be
fed to the boiler during the trial. In loca-
tions where the reliability of the power is so
important that an extra feed pipe must be
kept in position, and in general when for
any other reason water-pipes other than the
feed-pipes cannot be disconnected, such pipes
may be drilled so as to leave openings in
their lower sides, which should be kept open
throughout the test as a means of detecting
leaks or accidental or unauthorized open-
ing of valves. During the test the blow-off
pipe should remain exposed.

If an injector is used it must receive
steam directly from the boiler being tested,
and not from a steam-pipe or from any

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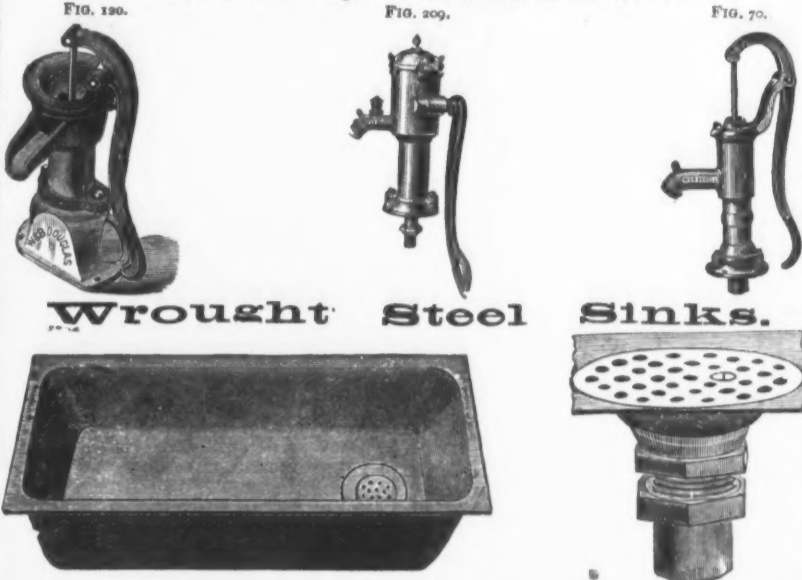
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other boiler. See that the steam-pipe is so arranged that water of condensation cannot run back into the boiler. If the steam-pipe has such an inclination that the water of condensation from any portion of the steam-pipe system may run back into the boiler, it must be trapped, so as to prevent this water getting into the boiler without being measured.

STARTING AND STOPPING A TEST.

IX. A test should last at least 10 hours of continuous running, and 24 hours whenever practicable. The conditions of the boiler and furnace in all respects should be, as nearly as possible, the same at the end as at the beginning of the test. The steam pressure should be the same, the water level the same, the fire upon the grates should be the same in quantity and condition, and the walls, flues, &c., should be of the same temperature. To secure as near an approximation to exact uniformity as possible in conditions of the fire and in temperatures of the walls and flues, the following method of starting and stopping a test should be adopted:

X. *Standard Method.*—Steam being raised to the working pressure, remove rapidly all the fire from the grate, close the damper, clean the ash-pit, and as quickly as possible start a new fire with weighed wood and coal, noting the time of starting the test and the height of the water level while the water is in a quiescent state, just before lighting the fire. While laying the fresh fire the damper should be closed. At the end of the test remove the whole fire, clean the grates and ash-pit, and note the water level when the water is in a quiescent state. After hauling the fire record the time as the end of the test. The water level should be as nearly as possible the same as at the beginning of the test. If it is not the same a correction should be made by computation, and not by operating pump after test is completed. It will generally be necessary to regulate the discharge of steam from the boiler tested by means of the stop-valve for a time while fires are being hauled at the beginning and at the end of the test, in order to keep the steam pressure in the boiler up to the average during the test.

XI. *Alternate Method.*—Instead of the Standard Method above described, the following may be employed where local conditions render it necessary: At the regular time for slicing and cleaning fires have them burned rather low, as is usual before cleaning, and then thoroughly cleaned; note the amount of coal left on the grate as nearly as it can be estimated; note the pressure of steam and the height of the water level—which should be at the medium height to be carried through the test—at the same time, and note this time as the time of starting the test; fresh coal, which has been weighed, should now be fired. The ash-pits should be thoroughly cleaned at once after starting. Before the end of the test the fires should be burned low, just as before the start, and the fires cleaned in such a manner as to leave the same amount of fire, and in the same condition, on the grates as at the start. The water level and steam pressure should be brought to the same point as at the start, and the time of the ending of the test should be noted just before fresh coal is fired.

DURING THE TEST.

XII. Keep the conditions uniform. The boiler should be run continuously, without stopping for meal times or for rise or fall of pressure of steam due to change of demand for steam. The draft being adjusted to the rate of evaporation or combustion desired before the test is begun, it should be retained constant during the test by means of the damper. If the boiler is not connected to the same steam-pipe with other boilers, an extra outlet for steam, with valve in same, should be provided, so that in case the pressure should rise to that at which the safety-valve is set it may be reduced to the desired point by opening the extra outlet, without checking the fires. If the boiler is connected to a main steam-pipe with other boilers, the safety-valve on the boiler being tested should be set a few pounds higher than those of the other boilers, so that in case of a rise in pressure the other boilers may blow off and the pressure be reduced by closing their dampers, allowing the damper of the boiler being tested to remain open, and firing as usual. All the conditions should be kept as nearly uniform as possible, such as force of draft, pressure of steam and height of water. The time of cleaning the fires will depend upon the character of the fuel, the rapidity of combustion and the kind of grates. When very good coal is used and the combustion is not too rapid, a 10-hour test may be run without any cleaning of the grates other than just before the beginning and just before the end of the test. But, in case the grates have to be cleaned during the test, the intervals between one cleaning and another should be uniform.

XIII. *Keeping the Records.*—The coal should be weighed and delivered to the firemen in equal portions, each sufficient for about one hour's run, and a fresh portion should not be delivered until the previous one has all been fired. The time required to consume each portion should be noted, the time being recorded at the instant of firing the first of each new portion. It is desirable that at the same time the amount of water fed into the boiler should be accurately noted and recorded, including the height of the water in the boiler and the average pressure of steam and temperature of feed during the time. By thus recording the amount of water evaporated by successive portions of coal, the record of the test may be divided into several divisions, if desired, at the end of the test, to discover the degree of uniformity of combustion, evaporation and economy at different stages of the test.

XIV. *Printing Tests.*—In all tests in which accuracy of results is important, calorimeter tests should be made of the percentage of moisture in the steam, or of the degree of superheating. At least 10 such tests should be made during the trial of the boiler, or so many as to reduce the probable average error to less than 1 per cent., and the final records of the boiler test corrected according to the average results of the calorimeter tests.

On account of the difficulty of securing accuracy in these tests, the greatest care

should be taken in the measurements of weights and temperatures. The thermometer should be accurate to within $\frac{1}{10}$, and the scales on which the water is weighed to within $\frac{1}{100}$ pound.

ANALYSES OF GASES.—MEASUREMENT OF AIR SUPPLY, ETC.

XV. In tests for purposes of scientific research, in which the determination of all the variables entering into the test is desired, certain observations should be made which are in general not necessary in tests for commercial purposes. These are the measurements of the air supply, the determination of its contained moisture, the measurement and analysis of the flue gases, the determination of the amount of heat lost by radiation, by infiltration of air through the setting, the direct determination by calorimeter experiments of the absolute heating value of the fuel, and by condensation of all the steam made by the boiler of the total heat imparted to the water. The analysis of the flue gases is an especially valuable method of determining the relative value of different methods of firing or of different kinds of furnaces. In making these analyses great care should be taken to procure average samples—since the composition is apt to vary at different points of the flue—and the analyses should be entrusted only to a thoroughly competent chemist who is provided with complete and accurate apparatus. As the determinations of the other variables mentioned above are not likely to be undertaken except by engineers of high scientific attainments, and as apparatus for making them is likely to be improved in the course of scientific research, it is not deemed advisable to include in this code any specific directions for making them. The report concludes with practical recommendations as to the recording of tests, and embodies a convenient blank for such records.

NEW PUBLICATIONS.**Art and Decoration.**

The first number of a new monthly magazine called *Art and Decoration* comes to us this month. It is a handsome publication of 34 pages, issued from No. 9 East Seventeenth street. Mr. Geo. R. Halm is art manager, and Mr. Caryl Coleman editor. The purpose of this magazine is eminently practical. It is devoted especially to useful ornament which can be employed in all forms of design and decoration, and very little, if anything, will claim a place in its pages which has nothing besides pictorial interest to commend it. Besides containing a large amount of original work, it will be eclectic to the extent of presenting the most useful and practical examples of design and ornament gathered from foreign periodicals. The illustrations and text of the first number relate chiefly to wall treatments in color, mantels, wood carving, underglaze tiles, lambrequins, wrought-iron work, gas fixtures, jewelry, Japanese mous and architectural ornaments in wood and stone. It is a very creditable effort, giving promise of permanent value, and deriving much of its interest from the charming initial letters, department headings, &c., designed by Mr. Halm.

WATCH AND CLOCK MAKING. By David Glasgow. Size 4 1/4 x 7 inches. 34 pages. Published by Cassell & Co. Price, \$2.

In view of the scant literature on the subject, Mr. Glasgow's work will prove a most welcome source of information and may, as he states, be of service in assisting the rising generation of watchmakers to overcome many difficulties which have proved stumbling blocks to others. The volume is intended not only as a text-book for technical classes, but is designed also as a book of reference for the practical workman. The progress of the watch and clock trade is traced down to the present time and the gradual steps are pointed out by which improvements have been effected. Theoretical and practical treatment of the subject has further been so combined as to prove both interesting and instructive.

STEAM USING OR STEAM-ENGINE PRACTICE. By Prof. Chas. A. Smith. Size, 6 x 9 1/4 inches, 228 pages. Published by the American Engineer. Price \$3.

Professor Smith's book is divided into five chapters, devoted respectively to heat and the properties of steam, valve gears, steam consumption, the indicator and the different classes of engines, the experiments of Hirn and Hallauer and steam heating. It is fully illustrated, and will prove of the utmost practical value, representing, at least in part, current practice in steam engineering.

Objection has been made by some to the use in the exposed parts of boiler shells of plates more than 3/4 inch in thickness. There might be some reason in these objections if all the steamboat boilers now afloat were compelled to work under the very trying conditions of service to which the Mississippi River boats are subject. So long as there are other conditions, however—very different ones, and vastly more favorable—there can be no reason for thus limiting the sizes of boilers as they must be if the plates are required to be kept down to 3/4 inch. The extremely cramped space allowed for the Western river-boat boilers crowds the burning fuel directly against the shell when a good fire is on the grate, thus causing a certain wear which would no doubt be increased materially if the plates were made much thicker and were still exposed to this intense local heat. The whole situation is changed when the boiler is lifted away from the grate, as it needs to be to give room and time for a complete burning of the coal before the gases evolved from it are whirled away and cooled below the temperature at which they can be burned. This excessive local heat is thus greatly reduced, and it becomes possible, and highly desirable and important, to increase the thickness of the plates, so that boilers may be built of larger size and may carry pressures which shall be fully up to the limit called for in the best modern practice in engines. Western river practice in boiler construction is highly important and successful as measured by the simple fact that a certain amount of work is actually done by such boilers. When this

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work is measured in economy by that which is done under sharp competition elsewhere, or by an accepted standard of pounds of coal per horse power per hour, it will be found to be so low as to forbid entirely that any detail of the construction involved should be taken as an arbitrary limit in other lines, which may be kindred to it, although wholly unlike. It is nearly an absurd requirement that the entire design of a boiler should turn upon the thickness of a plate which had been fixed by the requirement of some other kind of service, and yet it is just this that is urged or insisted on by those who would restrict the thickness of exposed plates to ¼ inch.

LATEST LEGAL DECISIONS.

MASTER AND SERVANT—CONTRIBUTORY NEGLIGENCE.

An employee was injured by a small piece of a cold chisel, on which he was striking with a spike maul, flying off and striking him in the eye. The employee was, as he testified himself, a blacksmith who had served an apprenticeship of three years in Europe, and one of his witnesses stated that "a blacksmith who had been an apprentice for three years should know on looking at a spike maul that it was not a proper instrument to use in striking a chisel, for splinters frequently fly from the head of a chisel." In an action to recover damages for the injury on the ground of negligence in supplying an improper implement the plaintiff recovered a judgment, and the defendant carried the case—Houston and Texas Central Railroad Company vs. Conrad—to the Supreme Court of Texas, where the judgment was reversed. Judge Steytton, in the opinion, said: "It does not appear that the cold chisel was defective in make, material or temper, but it does appear that even with a proper cold chisel small parts will frequently break and fly off. It is urged that the hammer which this employee was using was not as suitable for the purpose for which it was used as would have been one with a broader face. This may be true, but the facts in proof forbid the belief that he was ignorant of that fact. Persons who engage in a given employment assume the risks necessarily incident to that employment, and they cannot shut their eyes to dangers which are apparent, and voluntarily use implements which they know, or by the exercise of the knowledge which they have might know, are not so well adapted to the business in which they are engaged as some other instrument might be, and when injury therefrom results seek and recover damages for injuries which might have been by them avoided by the exercise of that ordinary care which it is the duty of every one to use. The facts in this case forbid any other conclusion than that the employee was sufficiently informed to know the risks of his employment."

PARTNERSHIP ACCOUNTING.
W., one of the firm of E. Conway & Co., to whom the firm was largely indebted, sued for a dissolution of the partnership, an accounting and a judgment for any deficiency beyond the proceeds of the firm property. W. had judgment for dissolution and an accounting, and on June 16, 1874, upon a reference it was found that there was due to W., after the partnership assets were given to him, the sum of \$12,493.17, but judgment was not entered against the other partners in his favor or a suit brought to recover the deficiency until May 26, 1879. The defence to this suit was the statute of limitations, it being claimed that the suit should have been brought within five years from the suit for dissolution of the firm and an accounting. The plaintiff had judgment, and the defendant carried the case—White vs. Conway—to the Supreme Court of California, where the judgment was affirmed. Judge McKee, in the opinion, said: "Until the dissolution of the firm was effected, and an accounting taken, and the assets of the firm applied to W.'s debt, the deficiency for which judgment was to be entered could not be ascertained, so the statute of limitations did not begin to run until this deficiency was fixed. The personal judgment against the other partners was justly entered, as it was so entered within five years from the finding of the deficiency."

TELEGRAPH COMPANY—CIPHER DISPATCH.
McK., a business man, who traveled in his transactions, sent a telegraphic dispatch at Houston to C. at Kansas City, as follows: "Twenty lamps, five looms, five bucks." This message was for certain linen goods in which McK. dealt. The dispatch was not delivered, and an action was brought for damages, in which the plaintiff recovered. An appeal was taken by the defendants, and the case—Western Union Telegraph Company vs. McKenny—was decided by the Supreme Court of Texas in their favor. Judge Willson, in the opinion, said: "It is plain that the message did not disclose its meaning, but is in effect a cipher message, which gave the company no notice of its pecuniary importance. Such being the character of the message, the rule laid down by perhaps the weight of authority as to the measure of damages for the failure to send or deliver such a message seems to be: If the message itself does not show that it is of pecuniary value or importance, and the company have no notice of its value or importance otherwise at the time they undertake to transmit and deliver it, the sender can only recover nominal damages, or the amount paid for sending it. And, further, if the company had knowledge of the value and importance of the message, the damage would be limited to such as might fairly, reasonably, naturally and directly arise from the breach of the contract according to the usual course of things, or such as may reasonably be supposed to have been in the contemplation of both parties at the time they made the contract as to the probable amount of the breach of it. In other words, the damages must be the natural and necessary consequences of the breach of the contract in the minds of the parties. Interpreting the contract in the light of the circumstances under which it was made special damages can be recovered only when it appears that the parties contemplated their recovery in making the contract. Nothing is shown here to justify the giving of special damages, and the judgment must be reversed."

BUILDING CONTRACT—FORFEITURE FOR DELAY.
M. sued L. upon a building contract, claiming \$11,887, and L. counter-claimed for \$7820, for breach of contract in delaying the work. The work was to be completed in 10 months, and there was a forfeiture of \$10 a day agreed on for each day's delay after the 10 months. The delay arose from the non-arrival of some necessary marble from Italy. This marble came, however, by the next ship. The defendant insisted that the daily penalty was not the measure of the damages, but the court ruled against this, and he carried the case—Muldoon vs. Lynch,—to the Supreme Court of California, where the judgment was affirmed. Judge Myrick, in the opinion, said: "The daily penalty was a 'spur' only to force the work through; it did not take place of any just damages for delay. There were no damages shown here and therefore the judgment must stand. If there were damages shown, the payment of the daily penalty would absolve the builder from them."

A Share Certificate of the Original Liverpool and Manchester Railway.

Homer Lee, of the Homer Lee Bank Note Company, has a curiosity in a railroad share certificate, which is one of the original share certificates of the Liverpool and Manchester Railway Company. This share is one of the issue that brought the funds on which Stephenson's invention was tested. There is no other in America. It was found in the settling up of an old estate, and came from the heirs of Edward Marwood into Mr. Lee's hands. The certificate is about 5 x 12 inches in size. It is embellished by a vignette, which occupies the upper half of the certificate. In the center of the vignette is Britannia, looking toward the exchange in Liverpool, with her left hand extended toward the exchange in Manchester; these structures are shown in the respective sides. There are three trains of cars shown on the picture, two headed for Manchester and one for Liverpool. Each is composed of six cars and an engine. The engine is simply a boiler on four wheels, with a pipe coming out of the front and turned upward like a stove-pipe out of a window. There is a small platform for the driver. The cars are square, with a wheel at each corner, open at the top and laden with merchandise. There are no passenger cars. On the sides of the vignette are the sentences: "Incorporated by act of parliament of the 7th George 4th," and "No transfer of any share is valid until registered by the clerk of the company." The title and text are as follows:

THE LIVERPOOL & MANCHESTER RAILWAY COMPANY.

No. 1531.
These are to certify, That Samuel Satterthwaite, of Liverpool, in the county of Lancaster, is proprietor of the share number 1531 of the Liverpool & Manchester Railway Company, subject to the regulations and orders of the said company, and that the said Samuel Satterthwaite, his executors, administrators and assigns, is and are entitled to the profits and advantages of such share.

Given under the common seal of said company the 14th day of December, in the year of our Lord one thousand, eight hundred and twenty-six.
Entered G. A. Pitt.
In the lower right hand corner is a large red seal of the company. On the back written in ink, appears:
Transferred to Edward Marwood, of Liverpool, in the county of Lancaster, ship broker. Recorded the twenty-fourth day of October, 1884.
G. A. PITT, Clerk of the said company.

The certificate is engraved on copper-plate and is printed on parchment skin. It is a clever piece of work, much better than some in existence to-day. The vignette bears the imprint "Alexander Mosses, 1826," and "E. Smith, Sculpt."

Exhaust Steam for Heating.—I have been somewhat surprised, remarks a correspondent of *Mechanics*, at the inquiries in regard to the profitable use of exhaust steam for heating. For several years past in buildings where power for elevators was required I have used the exhaust-steam from pumps or engine for heating, and find no disadvantage worth mentioning in point of economy. All that is required is to pipe the building as for an ordinary low-pressure gravity steam-heating job, using coils or radiators at pleasure, returning the condensed water to tank and pumping back to boiler. I generally also provide for taking live steam from boiler, using a pressure-regulating valve, to come into use when the supply of exhaust steam is insufficient.

An apparatus for separating tin from tin scraps has been patented by J. H. Kolb, of Brooklyn, N. Y. It consists of a tank in closing an open basket which is supported a short distance above the bottom of the tank. The basket is surrounded by a coil of steam pipe. A dissolving solution, such as a mixture of nitrate of soda and caustic soda, is poured into the tank and the tin scraps are placed into the basket. Steam is then turned on, and as it circulates through the coil it causes the dissolving solution to boil and to act uniformly on the tin scraps. The tin combines with the solution and forms stannate of soda. After the tin is thoroughly dissolved the steam is turned off and the basket is lifted out of the tank and emptied of its contents. When removed, the basket and coil are thoroughly rinsed to clean them of any deposits. The solution is poured from the tank and evaporated to recover the stannate of soda.

W. D. Wood, of Pittsburgh, Pa., has patented a new process of imparting a mottled appearance to the surface of planished sheet iron. Two-thirds of a pile of sheets are reduced between chilled rolls, and one third are reduced by soft rolls. The latter soon become roughened by wear, and impart a mottled appearance to the sheets. In packing the sheets in charcoal one soft-rolled sheet is placed between two hard-rolled sheets, and the pack is then baked. The planished surface is then produced by heating and hammering. The mottled appearance of the soft-rolled sheets will in the final hammering be transferred in part to the hard-rolled sheets, while the mottling on the soft-rolled sheets will be diminished. A uniform mottled effect is thus said to be obtained which is not excessive in degree, and which approximates closely the appearance of imported Russia sheet iron.

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"WHEREAS, I, GEORGE A. ROBINSON, of West Mansfield, County of Bristol, State of Massachusetts, have heretofore manufactured and sold certain Knives bearing a Mark which is claimed to be an imitation of the trade-mark owned by John Wilson, of Sheffield, England, which consists of four peppercombs and a diamond, under the mistaken belief that I had the right to do so.
NOW, This, is to Witness, that, in consideration of the forbearance of the Representatives of the said John Wilson, to sue me for damages for the wrong aforesaid, I do hereby undertake and agree,
FIRST, to surrender and deliver to the Attorneys for the said John Wilson all knives now on hand, and in my possession, or under my control bearing the said imitation trade-mark, and
SECOND, I further undertake and agree to and with the said John Wilson and his legal representatives, not to manufacture or sell, or cause to be manufactured or sold, at any time in the future, Knives or other Cutlery, bearing his trade-mark aforesaid, or any imitation or simulation thereof. IN WITNESS WHEREOF, I have hereunto set my hand and seal at West Mansfield, aforesaid, this thirty-first day of May, 1885.

WITNESSES—
E. M. REED,
(Attorney for Defendant.)

G. A. ROBINSON. L.S.

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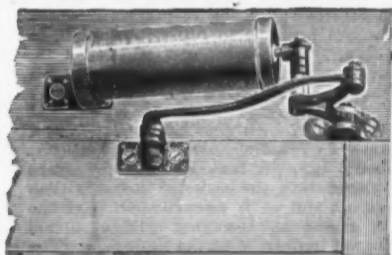
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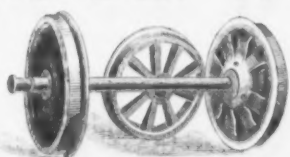
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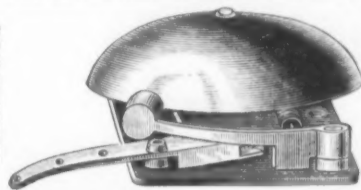
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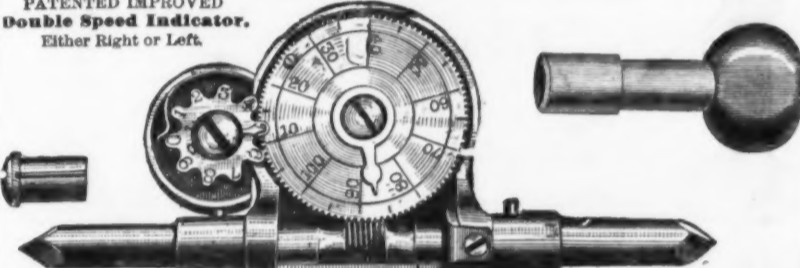
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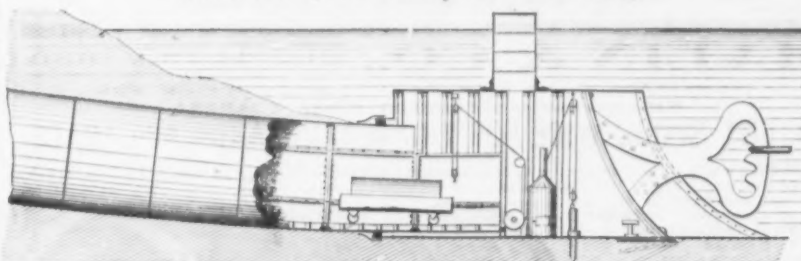
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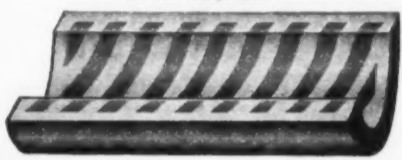


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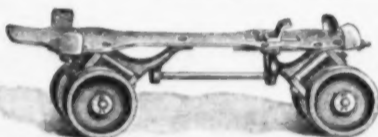
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Page Illustrated Catalogue of Light Hoisting Machinery and General Catalogue of Cranes Sent on Application.

Hardening Steel by Pressure.

Mr. F. H. Richards writes as follows in the April number of *Mechanics*:
For some months past certain statements have been going the rounds of the press, including some of the scientific and industrial journals, concerning an alleged new method of

or, possibly, it was not considered necessary to inquire into the state of the art elsewhere than in the Empire de l'Académie, already famous for originating (!) a standard of measurement comparable with nothing under the sun. In any case, some inquiry into the novelty of the invention may be of interest to American readers.

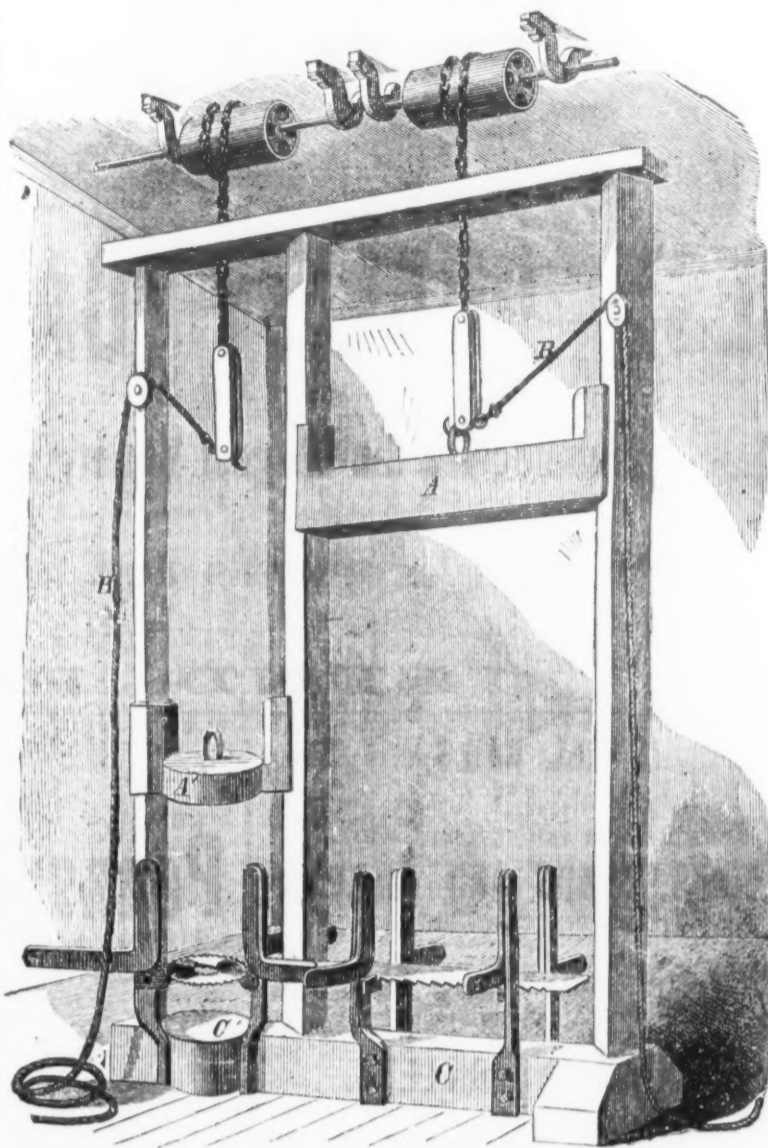


Fig. 1.—Drop Press for Tempering and Straightening Saws.

HARDENING STEEL BY PRESSURE.

hardening steel. The discovery, which is said to be a recent one, is credited to one M. Clemendot, and has been made the subject of an elaborate report by M. Ad. Carnot to a

"Knight's Mechanical Dictionary," edition of 1877, page 2033, in enumerating the processes in making a saw, says: "4. Tempering and Straightening.—The latter is effected by hammering on an anvil or by compressing several blades, while hot, between two dies worked by a hydraulic press." This does

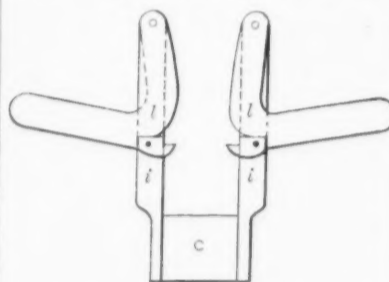


Fig. 2.—Arrangement of the Buttons and of the Dies for Releasing Them.

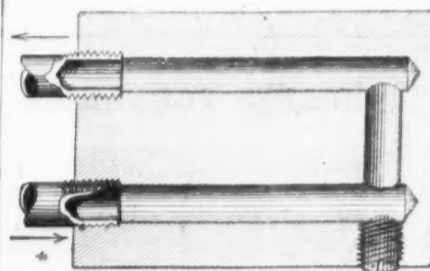


Fig. 4.—Horizontal Section of the Dies Through the Water Passages.

French society. This gentleman not only describes how the process is carried into effect, but gives, also, a technical account of the chemical and physical changes produced in the metal, and of the phenomena in general involved in the operation. In fact, the

not indicate any novelty in the application of a hydraulic press. On page 2527 (*Tempering*) Knight further says: "Thin plates of steel may be hardened by placing them

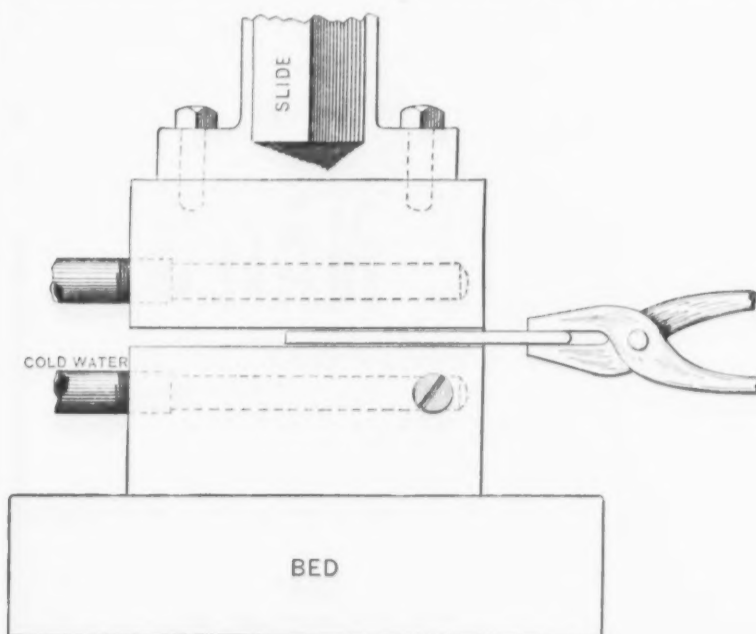


Fig. 3.—Arrangement of the Dies in a Screw Press.

whole matter is presented with admirable particularity, with the one exception that nothing is said about the history of the invention. How this trifling omission happened we can, of course, only conjecture. The author may have had but little acquaintance with the art, or imagined, perhaps, that things new in France were wholly new,

between two good conductors of heat, as a hammer and anvil."

"Appleton's Dictionary of Machines, Mechanisms, &c.," edition of 1866, vol. 2, page 584-5, says: "Saws.—Improvement in tempering and straightening, Waterman's patent. The usual method of tempering saws is to heat and then dip them in oil. This process is slow,

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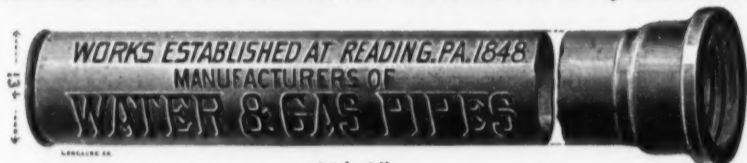
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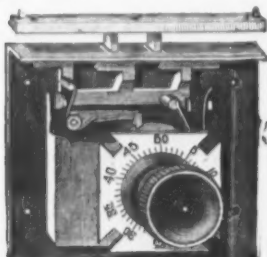
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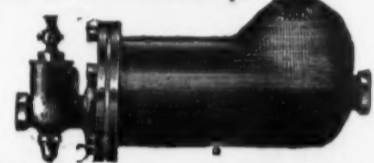
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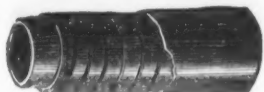
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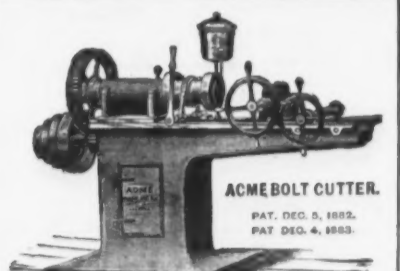
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laborious and costly; it is also disadvantageous, because the saws become warped, and require to be hammered up straight again by hand. The present improvement consists in tempering and straightening the saws at one operation. This is done by heating the saws to the proper degree, and then pressing them with a sudden and powerful stroke between the two surfaces of cold iron. Drop presses are employed for the purpose. The engraving shows a pair of presses conjoined, one for long and the other for circular saws. After being heated, the saws are supported in midair, on buttons attached to the framing at the base of the machine. The heavy drop-weights A A are now liberated by pulling the cords B B, and the weights fall upon their respective saws, drive them down and press them upon the solid iron base C with tremendous force. The sudden blow hardens the metal by rendering it more dense and also straightens the saw. The illustration accompanying this description is reproduced in Fig. 1, and is substantially the same as shown in the drawing of the patent. From this Fig. 2 is taken, showing the arrangement of the "buttons." This patent was granted to Henry Waterman, of Williamsburg, N. Y., May 27, 1851, being No. 8115.

The essential thing about the process here described, is the "heating the saws to the proper degree, and then pressing them * * * between the two surfaces of cold iron." The "powerful stroke" chiefly serves to drive out the air, and to secure a more perfect contact by shaping the heated metal to the cold surfaces for the purpose of producing a uniform cooling of the whole plate. If the dies and also the piece to be hardened are quite true, very little pressure is required. The reason why this method, although so long known, has been so little practiced, is that it is capable of only a limited application; that for general use it is slow, requires peculiar conditions, greater care and such correct forms of the things to be hardened as are seldom found in practical manufacturing; in other words, "it doesn't pay." This is proved by the fact that the method has in some cases been abandoned after long use for the old way of hardening in a cold bath or "quenching."

The hardening of certain kinds of tools by means of cold dies has been practiced in Connecticut for the past 15 years, and in Boston previously. The construction of the dies is shown in Figs. 3 and 4. For operating the dies a screw-press has been found very satisfactory, as by it a heavy pressure may be quickly applied and allowed to remain while the workman is attending to his fire. Another advantage is that any variation in the thickness of the pieces hardening does not affect the pressure, as it would in a crank press. For very large work a hydraulic press would undoubtedly be useful, as by this there could be more readily obtained the considerable pressure required to insure a perfect contact.

The use of dies for hardening flat pieces keeps these comparatively true, and where this is of first importance the method, of course, presents advantages. One serious objection to it is that the pieces are generally reduced in thickness by the pressure. It is true this fault might in some cases be an advantage, but in such cases the old way of hardening is usually preferred for practical reasons. One of these reasons is that the dies imbed into the metal every particle of scale, coal, sand or other "dirt" that is on the surfaces, necessitating scrupulous care in cleaning the pieces before placing them under pressure. Probably the best means for this purpose is a rapidly-revolving wire brush, over which the pieces are drawn two or three times immediately after they are taken from the fire or lead bath. Another reason is that in working regularly all the pieces do not harden uniformly throughout. In this respect the method is much less reliable than the usual cold bath.

In practice a slight variation in drawing the temper is much less objectionable than any want of thoroughness or uniformity in hardening. For this reason the use of hot dies for drawing the temper is more satisfactory than is the use of cold ones for hardening, especially as the one is practically about as effective as the other for straightening.

In utilizing this method for the hardening of plates for magnets, M. Clemandot has undoubtedly made one of its most useful applications; but to suppose that it is a practical substitute for quenching, except in a few exceptional cases, is a grave mistake.

Electrical governors have of late been a fruitful theme for discussion, and no end of praise has been bestowed upon them as regards rapidity and certainty of action and general efficiency throughout. Notwithstanding all their good points, however, no device of this kind, so far as we know, has yet been shown that will do what a good automatic cut-off gear will not do, and it will not be before some important developments in this direction have been effected that electrical-governor advocates will have reason to claim unparalleled advantages for their appliances. It has been claimed that an electrical governor worked "in perfect synchronism with the load or work to be done," but this, as was very appropriately pointed out, is simply an impossibility. Perfect synchronism cannot characterize the movements of a driver and driven if the latter is to be indirectly affected by a change in the speed of the former. The driven must always follow the driver, and, as an electrical governor can act only with difference of current or of potential, it must be indirectly connected by valves or pistons or otherwise with the steam cut off, and the truth of our remark as to the comparative values of electrical and other governors thus becomes obvious. Further investigations in the line of electrical governing attachments may, however, yield valuable results, and a good deal of interest will always be attached to them.

Speaking of the coal consumption of steamers of the Orient Line, running to Australia, an English contemporary refers to the immense stocks of coal kept at various coaling stations, such as St. Vincent, Madeira, Port Said, Singapore and others, the reserve at Singapore being about 20,000

tons. As to the rapidity with which these steamers are coaled, we find it stated that one of them, for example, last year took in over 1100 tons at Port Said in five hours.

English Letter.

(From Our Regular Correspondent.)

LONDON, April 27, 1885.

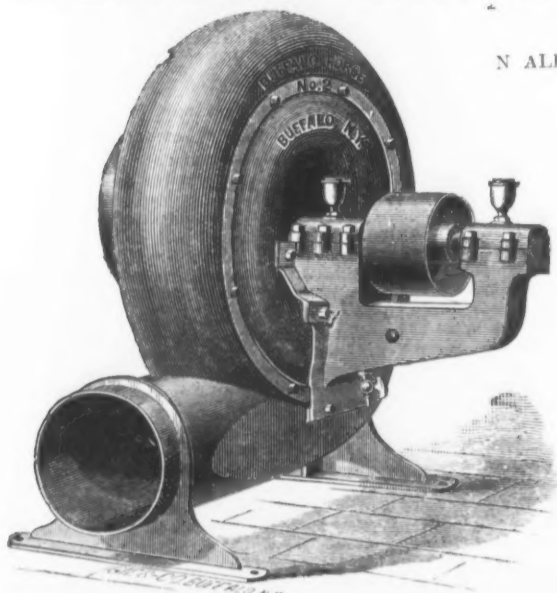
THE SITUATION

is critical, and an anxious one for all men of business. As I write the evening papers are being hawked about the streets and sold by the thousand, their display bills announcing "war imminent," and similar startling tidings. On all sides the political outlook is black, and we of this old country seem to be confronted with war and all its horrors and costs at a time when we had congratulated ourselves that we had the most pacific ministry of the century. Fresh complications seem to present themselves daily, until one is almost bewildered at the possibilities when once the dogs of war are let slip. It is pretty certain that the military party in Russia will prevail over the weak and vacillating circle of which the Czar is the center. The dominant idea being that it is only by going to war in Asia that peace can be preserved in European Russia. The treasury is bankrupt, the banks have advanced moneys for years on goods which cannot be realized, and bounties have been poured out for manufacturers whose products have never been used and lie rotting in the yards or workshops. Therefore the peace of the world is to be broken and thousands of poor men are to be slaughtered, in order that the Romanoffs despotism may be prolonged. A quarrel is being deliberately picked with us, and no concessions on our part seem sufficient to prevent the outbreak of hostilities. If war must be, however, we are not the sort of people to run away from it. We hope to bear ourselves well in the negotiations, and if we then cannot save our national honor, why, we must fight. To-night a special credit of £11,000,000 (say \$55,000,000) will be voted for the Government, and if they are able to satisfy the House as to their proceedings there is no doubt whatever that they may have £100,000,000 if they require it. We may be rather short of men at the outset of the war, but we have the money, and that can buy pretty much all that we may need in the way of allies and assistants. There are probably £400,000,000 to £500,000,000 of ready money or securities now in this country which the Government can have at any time by paying 3% for it. In the banks much of it is not earning 2%. We could foment trouble among the already dissatisfied and downtrodden peoples of Central Asia, Circassia, Georgia and the Caspian, and could so aid the Nihilists in Russia proper as to give the Czar's circle great trouble. We could buy Turkey and Persia, as well as all the tribes of Asia Minor, and it would be a powerful argument in deciding the course to be taken by Austria and Italy. Germany is believed to tacitly agree to the course of Russia in Afghanistan, as an outlet for restlessness which might otherwise be troublesome in Europe, while France is suspected of being in alliance with Russia. The prospect, indeed, bristles with difficulties, and, however hostilities might commence, there are grave reasons for fearing that all Europe would be speedily aflame, with Russia, Germany and France on one side, and England, Italy, Turkey, and Austria on the other—to say nothing of our Indian and Colonial forces. There might be trouble in Ireland and in Poland, whilst the fate of Belgium and Holland might tremble in the balance during such an awful scene of carnage. We most sincerely hope that no such struggle may take place, yet it would be foolish to ignore what is going on around us, and we are wise in preparing for the worst. These preparations are being pushed forward with every dispatch and much has been done already for the fleet, the army and for our national and colonial defenses. There is good reason for believing that the Government have also engaged quite three-fourths of the available fast steamers all over the world as cruisers and have made such arrangements as would prevent privateering on anything like a dangerous scale. Meantime freights are rising rapidly and insurances are on the basis of war risks. Commerce and trade are paralysed by the uncertainty that prevails, and there can be no real freedom of action until the question is settled. Men will not and cannot enter into engagements to-day which may be upset to-morrow, so that at the moment we await the verdict and have temporarily deserted trade in order to set our houses in order.

THE IRON MARKET.

Iron is unchanged in the main on the week, although in some quarters there are rumors of a little more firmness, consequent upon the impression that the outbreak of war would mean a general augmentation of values. At home the agricultural outlook is not unpromising, the seeding time having been one of the best on record, while the remarkably fine weather of the past week or so has brought forward everything so rapidly as to make up for the previous lateness of the season. This is a favorable feature, but it is much too early, of course, for the promise to be relied upon in business calculations. At Glasgow there has been very little movement in warrants, and the margins have been small, the closing price being 41/8 1/2 1/4 ton. In Scotch makers' brands of pig iron the changes of the week are represented by a reduction of 6d. 1/2 ton on two or three sorts. The shipments are still behind, and the reserve stock is now in excess of that of this date last year. At Middlesbrough makers quote No. 3 at 34/6 @ 34/3, but some of the merchants offer it at 33/6 @ 33/9 1/2 ton. Shipments are rather better for export, but less is going to Scotland just now, no doubt owing to the large stocks held at the East Coast ports of that country. On the West Coast hematite pig irons are quiet, with a steady land sale and fair shipments, but with no particular life in the market. The quotation for mixed lots of Nos. 1, 2 and 3 in usual proportions is 44/ for prompts and 44/6 @ 45/ for futures. Elsewhere all

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time the past winter, we have been obliged to
run full time, and even extra at times, to keep
up with our orders.

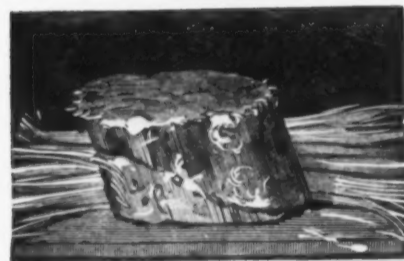
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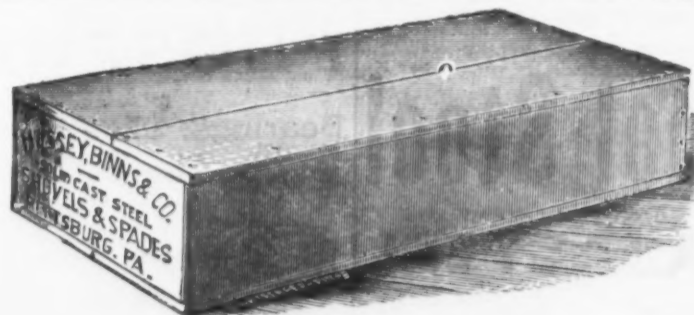
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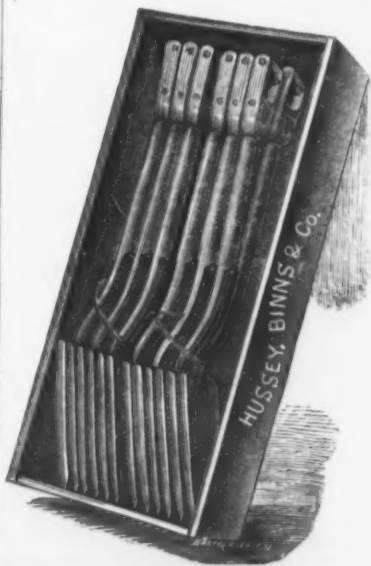
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The Labor Situation in the West.

There has been no marked change in the labor outlook in the iron mills of the West since our last issue, though the indications are that the manufacturers are more united in their determination not only to resist the demands of the Amalgamated Association, but to compel it to accept a reduction, while the Amalgamated Association is growing weaker every day. Notwithstanding the loud and constant asseverations of the Amalgamated Association as to the absence of any internal dissensions—assertions, however, not so loud as they were four weeks ago—it is evident that the association is not only weaker in numbers to-day than at any previous time in its history, but also that the bond of union between the different trades is a rope of sand. Many trades that heretofore have meekly followed the behests of the Amalgamated Association Scale Conference now assert their absolute independence of that conference, refusing to demand the prices that it has fixed and offering to work for wages far below the demand of the workmen's committee. The price for cutting steel nails is one example of this, the Amalgamated Association demanding 20 per cent. extra for cutting steel nails, the United Nailers of Wheeling offering to cut steel for the same price as iron.

The supposed strength of the Amalgamated Association appears to be now their belief in the weakness of the manufacturers and evidences which they claim to have that it costs considerably more to make iron in Eastern than in Western Pennsylvania. The *Labor Tribune* recently placed the cost of bar iron in Pittsburgh at \$31.41, as compared with \$40.69 East. The Eastern figures are so remarkable that we give them as follows:

Pig	\$15.00
Coal	8.00
Labor	11.25
Contingent	4.41
Interest	1.30
Total	\$40.00

If this is actually the cost of bar iron at the rolling mills in Eastern Pennsylvania, we shall at once look for a large crop of failures. Of course the estimate is simply an absurdity. No mill in the East gets its pig iron for a ton of bars for \$15, nor does it cost any mill \$8 for fuel to convert a ton of pig iron into a ton of bars. The

labor cost is above the average. The mill from which the above figures were obtained must be carrying an enormous amount of paper—mortgages, bonded indebtedness, &c.—to make the interest account \$1.30 per ton of iron. Just what is included in "contingent expenses" it is difficult to imagine, but if this includes only what is known as general charges, without interest, the mill no doubt will fail, and deserves to.

Since our last issue there have been two meetings of the Manufacturers' Committee in the West, at which it is understood that they have agreed upon a scale to be presented to the Amalgamated Association Committee at the meeting which will be held on the morning of the day of our issue; consequently, we cannot give our readers any information as to the result. As indicated in our issue of last week, however, the probabilities are that no result will be reached at this conference, and the country may probably prepare for a state of suspense on this question up to the 31st of May, with all sorts of rumors flying in the air.

The English Bessemer Steel Industry.

The details concerning the Bessemer steel trade of Great Britain, collected for the British Iron Trade Association by its secretary, Mr. J. S. Jeans, are interesting in many respects. How serious has been the falling off in the product may be gathered by a glance at the following figures, giving the output of ingots and the make of rails, in gross tons, for a series of years:

Production of Bessemer Steel in Great Britain.

Year.	Ingot.	Rails.	Per cent.
1877.....	750,000	58,400	67.79
1878.....	807,327	63,731	78.5
1879.....	884,511	519,718	62.28
1880.....	1,044,382	739,910	70.85
1881.....	1,441,719	1,021,740	71.03
1882.....	1,673,649	1,295,785	77.44
1883.....	1,553,380	1,067,174	68.73
1884.....	1,269,676	784,968	60.4

The percentages given have only a value for comparison. The quantity of ingots used for the manufacture of rails is really larger, because no allowance is made for waste in conversion. Still, the fact is prominently brought out that in 1884 the quantity of ingots rolled into rails was not only absolutely, but also relatively, considerably smaller—in other words, the amount of Bessemer steel used as the raw material for other products increased notably. The following table, compiled by Mr. Jeans, clearly shows that the make of Bessemer steel for other purposes than rails has been very large:

Production of Bessemer Steel other than Rails.

Year.	Tons.
1884.....	55,115
Merchant.....	47,738
Plates and fishplates.....	45,182
Billets.....	126,804
Blooms.....	4,300
Forgings.....	199
Tin-plate bars.....	10,308
Castings.....	10,999
Angles.....	302,280
Tires.....	

The heaviest item, that relating to blooms, is open to some doubt, since its destination is not or cannot be traced. Some of them may have been rolled into rails in England or in countries to which a part may have been exported. Practically none came to this country in 1884 as they did in 1882. By way of comparison with previous years it may be noted that in 1882 the quantity of Bessemer steel not rolled into rails in Great Britain was 303,500 tons, of which, however, 170,000 tons were blooms for export, leaving 133,500 tons for plates and 100,000 for other forms of merchant steel.

While the data are confessedly not complete, they show a good progress in the use of Bessemer steel for other purposes than rails, when the condition of business is considered. Prices for iron and steel have shown a growing tendency toward equalization. Thus, Mr. Jeans reports that the average price in 1884 paid by a large consumer was £6. 15/ for steel plates, as compared with £5. 5/ for iron plates; and £5. 15/ for steel angles, as compared with £5 for iron.

A study of the distribution of the make in different districts in England is instructive from more than one point of view. Thus, the output of ingots was as under during the last three years:

Production of Bessemer Steel Ingots.

District.	1882.	1883.	1884.
South Wales.....	483,086	534,966	387,728
Sheffield.....	430,000	285,763	305,983
Cleveland.....	326,924	304,606	285,704
Lancashire and Staffordshire.....	222,313	247,440	305,127
West Cumberland.....	191,326	210,645	215,154
Totals.....	1,673,649	1,553,380	1,269,676

The different districts participated as follows in the production of rails:

Production of Bessemer Steel Rails.

District.	1882.	1883.	1884.
South Wales.....	367,844	410,676	307,633
Sheffield.....	310,000	142,665	46,326
Cleveland.....	265,842	245,386	169,520
Lancashire and Staffordshire.....	141,306	125,011	90,525
West Cumberland.....	150,619	173,436	170,964
Totals.....	1,235,785	1,097,174	784,968

It will be observed that, so far as the blowing of iron in the Bessemer converter is concerned, there has been a tendency toward equalization of the different districts. The most striking fact, however, is that, while Sheffield has evidently lost its hold on the rail trade entirely, it does the heaviest business in steel for other purposes. Closely followed in this respect by Lancashire and Staffordshire, South Wales seems to make rails almost exclusively, which, too, in the Cleveland and West Cumberland districts, constitute the form in which the metal is chiefly marketed. Since that is a trade

which notoriously fluctuates widely, so far as the demand is concerned, this is not a distinction likely to be particularly flattering.

Mr. Jeans prints the following table of the number of converters running, idle and in course of erection:

District.	Work- ing.	Out of work.	Being erected.
Sheffield.....	16	12	—
South Wales.....	19	4	—
North of England.....	18	4	—
West Cumberland.....	11	—	—
Lancashire.....	14	6	—
Staffordshire.....	5	—	—
Scotland.....	—	6	—
Shropshire.....	—	2	—
Totals.....	88	26	8

Sheffield, the first home of the Bessemer converter, again shows evidences of weakness, but it is likely that some of the old works there have in reality fallen behind in the race of progress, and are unable to compete with better-planned and more favorably located modern works. A very interesting feature is the appearance of Scotland in the ranks of Bessemer-steel producing districts, a fact due to the introduction there at some of the oldest blast-furnace plants of the basic process.

Mr. Jeans has compiled his usual statement of the tonnage of ingots produced per converter employed during the year, the figures being:

Year.	Tons.	Year.	Tons.
1881.....	13,125	1883.....	20,991
1882.....	17,582	1884.....	15,658
1883.....	20,930		

But little importance can be attached to this series of figures beyond the showing it makes in a general way of the fact that the converters employed were not running as near capacity, by far, as they did in previous years. There is such a wide difference between the size of converters, and between the capacity when working on different grades of steel, that it is practically impossible to give numerical expression to the average capacity per vessel.

On the whole the statistical returns of the business of the Bessemer steel works of Great Britain during 1884 is not particularly encouraging reading to those engaged in that branch of manufacture, and thus far this year there have been no indications warranting the belief that an early improvement can be looked forward to.

Railroad Bridge Inspection.

The Railroad Commissioners of the State of New York have undertaken a work which promises to be of the greatest practical utility and value. They propose to examine and test, through competent engineers and with the co-operation of the railroad companies, every one of the 3500 bridges—iron and wood—in the State. In their report for 1885 they announce that this examination has been in progress for over a year, and that by 1886 the board will be ready to report the dimensions and strain of every truss in all these bridges. New York is the first State to attempt this project, which was suggested in 1875 by the American Society of Civil Engineers, who appointed a committee to prepare standard tables of safe strains to be allowed on wood and iron per square inch in tension and compression. The accurate calculation of the strain on a particular truss requires a thorough technical education, especially where the truss is of complicated form, rendering it difficult even for experts to test the strain. Owing to this fact the trusses in iron bridges are now made of as simple form as possible. In January, 1884, the commissioners mailed the following circular letter to the various railroad companies of the State:

Sir: Will you please send to this board drawings or tracings of all the truss bridges on the lines owned, leased or operated by your road, numbering the same in consecutive order, stating the location of each and the time when built. The board desires such drawings and diagrams as will show the construction of the various members of the bridges, with the dimensions of the same, also the floor system adopted. It also desires a strain sheet to accompany each drawing, showing the strain on each member produced by the maximum moving load allowed upon the bridge, together with the weight of the superstructure. The board also desires a plan of the general standard of floor system adopted, whether for large or small openings. The board recommends a floor system for all openings, including cattle guards strong enough to support a derailed truck, with guard rails to guide the wheels of the same in such contingency.

Some of the roads evinced at first an unwillingness to comply with this request, but the opposition died away in a short time. The engineers of the railroads in making the examination have discovered many weak places, which are in most cases strengthened before the drawings are sent in. A competent bridge engineer in the employ of the commission goes over the road and makes a re-examination. The board accepts figures in regard to the maximum furnished by the companies, unless they are plainly too light. In this case it assumes that the locomotive weighs 80,000 pounds, on four drivers of 14 feet 9 inches wheel base, the tender 48,000 pounds, followed by a maximum rolling load of 2240 pounds to a foot of track, so placed as to produce the greatest strain on the web members. Sometimes the reports of a company show the rolling load to be 3000 pounds to the foot.

It is found that in certain old structures there is a constantly recurring strain of 20,000 pounds to the square inch in the suspension-rods, with no reason to believe that every rod is doing its duty. The requirements of the commission are that iron shall not be strained more than 10,000 pounds to the square inch, or wood more than 800 pounds,

in tension and in compression. There are various other requirements suggested or approved by railroad engineers. The necessity for these regulations arises from the fact that there has been a great increase in the weight of rolling stock in recent years. Formerly the maximum weight of a locomotive and tender was 55 tons, and of a freight car 19 tons; now it frequently reaches 87 tons for locomotive and tender and 35 tons for car.

Spanish Copper Companies.

Among the giants in the copper trade the Rio Tinto Company is certainly the greatest, since taking the copper directly produced and that afterward extracted from burnt pyrites after their use for the manufacture of sulphuric acid, it supplies the markets of the world with more of the metal than any other mine in existence, the 1884 product of the Calumet and Hecla not even exceeding it. How the figures will stand in 1885 may be questioned, but we believe that the American mine will again forge ahead. The Rio Tinto report is always looked forward to with keen interest because it is so great a factor, and this has been particularly the case this year, since it was believed that the low prices would tell sharply on the revenues of the company. The business of the concern is in two directions—it sells pyrites in the open market and works a large quantity of ore on the spot, shipping the precipitate, which is refined in England. The competition of the Solvay ammonia-soda process with the old Leblanc method threatened to seriously diminish the demand for the pyrites, and the companies controlling the Spanish mines were forced to come to the aid of the soda-makers by making concessions. These the Rio Tinto company have tried to counteract by increasing the quantity sold, their contracts till 1889 calling for 400,000 tons annually. Their principal effort during the past years has, however, been the development of copper production on the spot. The following figures clearly illustrate this, being the make of fine copper in tons of 21 cwt., net, for a series of years:

Copper Production of the Rio Tinto Mines.

Year.	Tons.	Year.	Tons.
1876.....	946	1881.....	9,466
1877.....	2,405	1882.....	9,740
1878.....	4,184	1883.....	12,395
1879.....	7,179	1884.....	12,668
1880.....	8,559		

There has been a steady increase which, if the avowed plans of the company are carried out, would find a limit only when a product of 20,000 tons is reached. It has been estimated by good authority that the Rio Tinto Company can lay down copper in London at about £25. This figure may be correct if no account is taken of the heavy annual payments for interest and sinking fund. The profit in 1884 was £274,142. Referring all the profits to the metal product alone, this is equivalent to about £22 per ton of copper made. Now, the net income yielded by the sale of pyrites must have been very large, so that, after all, the margin between cost and selling price on the copper is not by any means so large as it is made to appear. The company have a bonded debt of £3,541,040 or more than \$17,000,000, the interest on which is a very heavy charge added to cost. The most favorable point in connection with the report for 1884 submitted by the directors is the important improvement in the grade of the ore. The following table will illustrate this:

Product of the Rio Tinto Mines.

	1882.	1883.	1884.
For shipment.....	259,924	313,251	312,028
Local treatment.....	686,307	786,682	1,067,890
Total.....	946,231	1,099,933	1,380,918
Average contents, per cent.....	2.805	2.956	3.234

It is, of course, important to judge whether this improvement in the grade is really a bona fide betterment of the character of the ore, or whether it grows out of attacking reserves known to give a higher yield. It is certain, however, that the Rio Tinto Company have a large margin to work on, and that present copper prices are calculated rather to stimulate their efforts to add to their make rather than to induce them to think of curtailing.

Another of the great pyrite mines of the Peninsula is the Mason & Barry, Limited, working the San Domingo mine in Portugal. In 1884 the mine produced 344,459 tons, against 382,555 tons in 1883; the shipments of pyrites having fallen off from 123,450 to 90,953 tons. In spite of these facts the concern made a profit of £173,510 and paid 8 per cent. dividends on a capital of £1,851,640, a fair result considering the circumstances. The third great company, the Tharsis, have not yet published their financial results. It is safe to conclude from the two quoted that the mines of the Peninsula will go on in spite of the fact that copper is ranging so low in the markets of the world. To struggling producers in other countries the results of 1884 hold no prospect of relief from stoppages in that quarter.

When the colonization craze seized the Germans a number of out-of-the-way countries were brought to their notice. Among them was Angra Pequena and the Namagua Land. The shadowy title to the latter which a trader, Herr Luederitz, possessed was transferred to a company for the consideration of 600,000 marks. One of the inducements held out to the purchasers of square miles of unknown, unexplored territory in South Africa was its boundless mineral wealth.

The copper producers throughout the world grew faint hearted when they were told of the enormous bodies of rich copper ore. They were more inclined to credit the stories because south of the new German colony are the famous Cape mines, the Springbok, Spektakel and Ookiep, connected by railway with Port Nolloth. These mines have for many years produced about 5000 tons of ingot copper, and have yielded annually to their shareholders more than 50 per cent. on their original investment. It was not beyond possibility, therefore, that Herr Luederitz's successors might add fresh burdens to an already overloaded copper market. In due time an expedition was sent out, headed by a gentleman who had at one time sat at the feet of the venerable professors at the Freiberg School of Mines. He sent back a lot of samples, which his backers hastened to submit to the judgment of the learned professors. The whole lot proved a worthless collection of cobblestones. Herr Pohl, the "mining engineer," labeled specimens of specular iron ore "ruby silver," and thus at one fell swoop ruined what reputation he may have possessed and the high hopes of his employers. The copper trade may breathe more freely, while the colonizing Germans will have their mistaken ardor dampened.

Condition of the Anthracite and Bituminous Furnaces May 1, 1885.

In another column we give our monthly report showing the condition of the anthracite and bituminous furnaces of the United States on the 1st day of May, 1885. The table, in a condensed form, presents the following:

Fuel.	In blast.	Out of blast.
	No. Weekly capacity.	No. Weekly capacity.
Anthracite.....	80 20,729	140 32,515
Bituminous.....	95 46,397	127 41,870

To furnish data for comparison the following table is presented, showing the number of furnaces of each class in blast on the first day of each month of the present year, and the capacity of the same:

	Anthracite.	Bituminous.
	No. in blast.	No. in blast.
January 1.....	81 21,564	82 35,812
February 1.....	81 21,180	87 41,633
March 1.....	86 22,889	91 45,774
April 1.....	82 21,704	90 45,655
May 1.....	80 20,729	95 46,397

This table seems to indicate that the anthracite and coke iron branches of the trade are pursuing opposite courses, the anthracite furnaces being credited with a steadily decreasing number of stacks in blast, while the bituminous and coke furnaces in blast are as rapidly growing in number. By referring to the table in detail it will be observed that there have been but few changes among the anthracite furnaces. Quite a number of fluctuations have, however, taken place among the coke furnaces, which have not affected the totals of the table.

It is reported from England that a movement is on foot in that country to establish a copper institute on the plan of the British Iron and Steel Institute. While we cannot believe that copper is of sufficient importance in the arts and manufactures to warrant the formation of a technical society for the sole purpose of investigating its properties and studying its merits, with a view to its more general adoption as a substitute for iron and other metals, it is yet a significant sign of the times that the business public is realizing the fact that copper is destined to play a more important part in the future than its comparatively limited use in the past would seem to indicate. The present enormous annual output of the copper mines of the United States has already in some degree enlarged the market for this metal, and its further consumption is only dependent upon the price at which it can be sold. Its superior qualities would make it a readily accepted substitute in many instances where iron has been previously used, provided its cost could be so reduced as to place it on a relatively equal footing with the cheaper metal. For use as a roofing material it stands unequalled, and despite its greater first cost it is being extensively employed for this purpose. How far it is applicable to the manufacture of plumbing fixtures has not yet been determined, but its durability and working properties fit it eminently for this as well as a multitude of other purposes, and if the producers will be content with making a small percentage of profit on a large output, instead of closing, or partially closing, their mines, with the result of forcing up the price, copper will before long open for itself a much more extended field of application.

The iron trade is, we believe, thoroughly aroused to the changes now going on which grew out of the substitution of steel for iron in many departments. We have endeavored to follow developments closely and to peer into the future so far as a careful consideration of the present made that possible. We have been accused even of being too sanguine on that point. Whether or to what extent our opinions will be borne out, the future will reveal. We must, however, join our more conservative friends in a protest against the sensational claims of the daily press of some of our iron-making cen-

ters. With one majestic sweep they brush the puddling furnaces out of existence, pronouncing the value of such plants equivalent only to what the doors and frames will sell for as scrap iron. It will take years before the changes now begun have been worked out. There are probably limitations to the use of steel for a great variety of purposes of which we may now have only an inkling, but which actual daily experience with the new material may develop. It has not been all plain sailing thus far, and it cannot be expected that it will be in the future. An attempt to bound forward would prove disastrous to progress. Our iron-makers recognize this, and the condition of business is imposing caution upon those who might have been inclined in flush times to move with undue precipitation. It is a particularly encouraging feature that a good many of the mills are gaining experience in handling steel by working purchased raw material, so that if they finally do discard their puddling furnaces they will be better prepared for the change. The iron trade will move forward deliberately and safely, and the puddling furnace will continue to contribute a heavy proportion to the make of the country. Our principal point should not be forgotten when speaking of the future of the puddling furnace. Steel is either good steel or worthless. There do not exist those numberless gradations from the very highest quality to the very poorest, which we have in iron. There is a use for the poorest iron, but with steel the falling below a given standard means simply unfitness for anything but the scrap pile. Then, too, there is often an enormous quantity of old material in the country which cannot be employed in steel-making and which will be used in producing merchant wrought iron. Any crowding in of steel will result in a constant corresponding decline in the selling prices of this old material.

An instructive and suggestive little incident happened this week, which teaches the lesson of patience, at least. On Tuesday there was received at this office a package containing an electrolyte. It was mailed to us in Cincinnati, April 10, 1882. The address on the tag was written by a gentleman who has been dead nearly three years. The electrolyte was from a cut of an article made by a company which failed two years ago and went out of business. Accompanying the package was the following letter:

POST OFFICE, CINCINNATI, OHIO, May 9, 1885.
The accompanying piece of mail matter was found upon removal of the permanent fixtures from the old post office to the new Government building. It is herewith forwarded to your address. Very respectfully,
S. A. WHITFIELD,
Postmaster.

The only parties to the transaction who have lived to see it consummated are this journal and the United States Post Office Department. It is interesting.

WASHINGTON NEWS.

(From Our Special Correspondent.)

WASHINGTON, D. C., May 12, 1885.

The President said to the correspondent of *The Iron Age* in conversation to-day: "I hope this rush of office seeking will soon be over so that I can settle down to something useful. If this constant rush don't abate very soon it will be a poor outlook for me for the next four years." The President regards the financial, the silver and the tariff questions as matters of vital importance, and desires to give them earnest study and attention before Congress assembles, so that he will be prepared to urge some specific recommendations, either in his own message or the report of the Secretary of the Treasury, to Congress. In the management of public affairs the President exceeds all expectations. He takes a statesmanlike view of all public questions, and his sincerity of purpose and methods are quite refreshing after the duplicity exhibited by many persons in high places, at least since the days of Grant. He is much like Grant in his integrity and zeal.

Representative Randall said to your correspondent to-day that he had intended calling a meeting of the committee to investigate the producing capacity of the steel works of the United States this week, but owing to the condition of his health he had written to Mr. A. S. Hewitt, of New York, also a member of the committee, asking him to take charge of the investigations. That gentleman, however, in reply, has suggested that the investigations be postponed until fall, so that Mr. Randall, who had already given much attention to the subject, might be able to be with the committee. Mr. Hewitt's suggestion has been adopted, and September has been named as the time to begin operations.

THE REMOVAL OF MR. NIMMO.

The removal of Joseph Nimmo, Jr., for some years Chief of the Bureau of Statistics, has created some excitement, not so much on Mr. Nimmo's personal account as on the effect that it may have upon the work. The restoration of Mr. Whitney as Chief Clerk would doubtless remove this difficulty, as his experience in the details of the Bureau would keep it in line. Mr. Snitzer, the new Chief, will be judged from his work when the public have occasion to use it. The importance of this Bureau has never been fully appreciated nor understood. The Secretary is credited with the intention, originally, to retain Mr. Nimmo, but having dropped on to a document prepared by that gentleman, entitled "The Protection of Our Enormous Commercial and Industrial Institutions—Shall the Care of these Interests be Remitted to the Bourbon Democracy of the Solid South." He decided that the effusion was decidedly "active partisanship," and forthwith off went his head. So much for Nimmo.

A VALUABLE DOCUMENT.

Some time during the present month there will issue from the Department of State a document, in three volumes, entitled "Labor in All Countries." The first and second volumes will embrace the countries of Europe, and the third labor on the other continents of the world. These reports are very voluminous and thorough. They embrace the replies of over 100 consuls of the United States to a series of very comprehensive questions. In order to obtain the information each consul consumed more than six months in the collection of data. These reports will be particularly valuable for the reason that the consular officers were clothed with official instructions, and were therefore recommended to manufacturers as entitled to their confidence and respect. The usual run of American writers on these subjects have been looked upon with suspicion by foreign manufacturers, and their work has consequently been of little or no value as authoritative data. The Department of State expects to furnish to the people a supply of this character of information which can be accepted as official.

CUSTOMS DECISIONS.

The Secretary of the Treasury has decided Section 2931, R. S., requires that protest and appeal to be valid must be filed within 10 days after ascertainment and liquidation of duties, as well in cases of merchandise entered in bond as for consumption. The Department decides, upon the advice of the Solicitor of the Treasury, that the liquidation herein referred to is the original liquidation on the import entry, whether for consumption or for warehouse, and not that made on the withdrawal entry. Protests and appeals filed on entries made on and after May 10, 1885, will be required to be within this rule, and previous decisions are modified accordingly.

Obituary.

WILLIAM BROWN.

William Brown was the agent in New York City for S. & C. Wardlaw, steel converters and refiners, Portobello Steel Works, Sheffield, and Congress Rolling Mills, Oughtibridge. His death on Sunday, the 10th inst., at his residence in Brooklyn, occurred with a suddenness that excites mingled regret and surprise. Although he had not been well for several months, a fatal termination was not expected, but, with a system already considerably reduced, an attack of pneumonia found him in no condition to combat the disease. One of his business associates attended him faithfully to the last in co-operation with the physicians.

Mr. William Brown was born 52 years ago in Sheffield, and in a business point of view was an offshoot of the old firm of Henry Brown & Sons, of that city. From Sheffield he went to Australia to engage in the hardware business, and thence he withdrew about 16 years ago to engage with the steel firm of S. & C. Wardlaw in New York. Two years later he assumed the agency of the firm, discharging its duties with full acceptance, winning for himself and associates an honorable name, together with substantial evidence of success. He leaves a wife and six children, of whom two sons are in the steel and hardware trade. He was both treasurer and Sunday-school superintendent in the Church of the Atonement, South Brooklyn.

The New Sliding Scale in Iron Mining in the North of England.

As the notice that has been given for the termination of the sliding scale in the iron trade in Cleveland has been admittedly given in order that it may be amended, it is interesting to notice the course of the trade under the scales that have ruled in it. The *Engineer* states that the realized selling price of pig iron is the determinant of the extent of changes in the wages of the iron miners and of others. The price of pig iron fluctuates a good deal under the first scale, but from about the middle of the year 1881 the average realized price advanced sharply from 36/9 to 43/6 at the end of the third quarter of 1882. From that time to the present it has fallen, though not regularly, and at the present time it is nearly 9 less than the last-named figure. It should be noticed that the price is not, as with the coal, the price realized for the whole of the produce—it is the average realized price for one quality of iron, though that is probably as good a basis from which the movements of the scale are to be taken as any. As yet the miners have benefited by the sliding scales, and, though the greater rapidity of the movement—the quicker "sliding," that is—makes the scale tell against the miners in a falling market such as the present, yet that would be compensated for, if the market were to turn, or, rather, when the market does turn. The last scale was settled on when the course of trade was much more uncertain than it now is, for there had been a partial revival which some thought and most men hoped would prove enduring. We have, however, now come to a time when the range of prices is so low that a change will be brought about by the necessary reduction of the output by firms which cannot very readily produce at so low a rate, and it would be therefore inadvisable to lessen the rapidity of the movement of the scale, for in that is the adjustment to the changing circumstances of the trade that makes it really valuable and useful.

Thirteen State Bureaus of Statistics of Labor are now in existence. The oldest, that of Massachusetts, was established in 1869. Mr. Wright, now at the head of the National Bureau, being still its chief. The bureau of Pennsylvania, next in age, was established in 1872, Joel B. McCamant being its chief. The bureau created in 1873 in Connecticut was afterward discontinued. In 1877 Ohio created a bureau, Henry Lusky being now commissioner. That of New Jersey was next in order, created in 1878, James Bishop being chief. In 1879 three were added—In Missouri, H. A. Newman, commissioner; in Illinois, John S. Lord, secretary, and in Indiana, William A. Peale, Jr., chief. The next in order were four created in 1883—In

Condition of the Anthracite and Bituminous Furnaces of the United States, May 1, 1885.

MAY 1.	ANTHRACITE.					BITUMINOUS.				
	Total number.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.	Total number.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
DISTRICTS.										
New England	1	0		1	160					
New York	40	7	1,765	33	8,505	1	0		1	285
New Jersey	17	2	640	15	4,125					
Pennsylvania:										
Lehigh Valley	51	23	7,335	28	7,630					
Schuylkill Valley	44	13	3,075	31	6,900	1	0		1	700
Upper Susquehanna Valley	24	9	2,179	15	2,460					
Lower Susquehanna Valley	38	25	5,615	13	2,035					
Juniata and Conemaugh Valley						27	12	4,764	15	2,855
Allegheny Valley						4	1	500	3	247
Youghiogheny Valley						6	4	1,360	2	741
Allegheny County						17	13	9,030	4	4,800
Shenango Valley						28	6	3,780	22	7,000
Maryland	5	1	120	4	700	1	0		1	140
Virginia						12	5	2,061	7	2,360
West Virginia						7	3	1,456	4	1,370
Ohio:										
Mahoning Valley						18	9	3,660	9	3,220
Eastern Central and Northwestern						18	10	4,510	8	3,000
Hocking Valley						15	1	170	14	2,432
Hanging Rock						15	7	1,376	8	1,465
Kentucky						3	2	750	1	400
Tennessee						8	6	2,620	2	980
Georgia						1	0		1	600
Alabama						10	8	4,220	2	370
Indiana						2	1	200	1	200
Illinois						16	6	5,400	10	6,575
Missouri						7	1	550	6	3,010
Michigan						2	0		2	580
Wisconsin						3	0		3	1,540
Colorado						1				
Total	220	80	20,729	140	32,515	223	95	46,397	127	44,870

New York, Charles F. Peck being now commissioner; in California, John S. Enos; in Michigan, John W. MacGrath, and in Wisconsin, Frank A. Flower. Last year two were added—In Iowa, E. P. Hutchins, and in Maryland, Thomas C. Weeks, chief.

METALLURGICAL NOTES.

Sulphur Crystals on Blast Furnace Clinker.

C. A. Meissner, writing to the *School of Mines Quarterly*, states that some time ago, in looking over an old pile of clinker, he noticed a number of yellow incrustations, which, on close examination by magnifying glass and a few quantitative tests, proved to be little rosettes of sulphur crystals. They were to minute to examine their separate form, but were almost invariably in form of rosettes. They were bright yellow when found, but soon turned a dirty white on the shelves of the mineralogical collection. They were found almost exclusively in a mass of fused coke and clinker taken from the furnace at the time of blowing out. When occurring on clinker alone they were white and lost their rosette form more or less.

Plant and Processes.

An injector for forcing a blast of steam and air beneath the grate bars of a culm-burning furnace has been patented by F. E. Fahrig, of Scranton, Pa. The blast-pipe, which enters the ash pit, is provided with a bracket which projects into the pipe and encircles the steam supply-pipe. This steam-pipe terminates in a ring provided with a number of perforations arranged at such an angle that the steam jets will converge or focus at a point below. In this way the air is drawn through as well as around the circle of live steam, and is forced with the steam into the furnace. By pushing the steam-pipe a little further in or out, the position of the ring may be adjusted till a point is reached where the maximum effect is obtained. This injector is claimed to be practically noiseless.

The Trenton Iron Company, of Trenton, N. J., are the assignees of the patent right in a new metallic fabric to be used for fencing, screens, bed bottoms and similar objects. The fabric is composed of a series of spirally-twisted strips of sheet metal united by wire cables. The strips may be flat or rounded in cross-section. The strands which form the cables are twisted in such a manner that they embrace the strips and lodge in the turns or twists thereof. In this way the cables and strips are firmly united, and no shifting or displacement of the joints can take place. The patentee claims in his patent a shorter radius at the middle part than at the ends, in order to produce a sharper pinching effect at that point. As the dies are blunt and work on each other they do not sever the blanks from the bar but simply form a curved recess. The bar in this condition is submitted to the action of a pair of knives which sever the blank. When the dies are forming the front edge of one blank they form the rear edge of the preceding blank. The blank thus made is subsequently used by welding it to the poll of the axe and then drawing it out to form the cutting edge of the same.

The Scoville Mfg. Co. of Waterbury, Conn., are the assignees of the patent right in a new compound wire. The core of this wire is made of steel or similar metal, while the envelope is made of copper. The envelope or covering is made of such a size as to pass at least twice around the core. A short double turn is formed at or about the middle of the covering—that is to say, it is

first bent up at right angles and then forward at right angles. The upright portion thus produced should be equal in length to the thickness of the copper. By this construction an inner and an outer shoulder is formed, and when the envelope has been properly applied its inner edge abuts against the inner shoulder, while its outer edge abuts against the outer shoulder. In this way the covering is made with a smooth or cylindrical inner and outer surface. It will be observed that this compound wire is without the ridge usually produced by the overlapping edge of the envelope, and that no solder is employed in its manufacture.

The Harvey Screw and Bolt Company, of Connecticut, have procured a patent for a machine for nicking screw blanks. In this machine the blanks occupy vertical positions in notches formed in the periphery of a feed-table, surrounded by a stationary guard which holds the blanks in the notches. These notches are made V-shaped, so that the blanks will be firmly held therein during that portion of their motion in which they have the nicks cut in their heads. The cutting of the nick is effected by a circular saw rotating on a horizontal axis and mounted in stationary bearings in such a position that its lower edge projects into the path of the heads to a sufficient distance to cut the nicks to the proper depth as the blanks are successively carried under the saw by the rotation of the feed-table. The feed-table may be made to rotate either upon a horizontal or a vertical axis.

A hot-blast stove of the kind in which a mass of refractory material is first heated by hot gas and the air blast is subsequently passed through the refractory material has been patented by F. W. Gordon, of Allegheny, Pa. The stove is of cylindrical shape and is divided by an upright partition into a combustion chamber and a regenerative chamber. The latter is subdivided in the customary manner by a series of walls crossing each other at right angles. A partition within the regenerative chamber divides it into an uptake and a downtake. The stove is provided with the usual valves and inlets. In operating the stove the cold-blast and hot-blast valves are closed and the chimney-valve and gas-valve are opened. In this condition the gas ignites at the foot of the combustion chamber, and, after passing up to the top of this chamber, descends through the downtake and is finally discharged to the chimney by the uptake. After the stove has been sufficiently heated the gas and chimney valves are closed, and the hot-blast and cold-blast valves are opened. The blast is now put through the stove in a course directly the reverse of that taken by the heating gases.

A regenerator furnace constructed to economically consume natural gas has been patented by W. S. McKenna, of Pittsburgh, Pa. The spaces at the right and left of the heating chamber are divided into two compartments by means of four central walls and the two end walls. The outer compartments contain the customary checker-work, and are connected to an air-supply-pipe at the bottom. At the top these spaces are partially arched over, so that the air is crowded against the end walls before it is admitted to the heating chamber. The inner compartments contain the gas-pipes. In operation the gas is ignited and the air admitted within the compartments on one side of the furnace, and commingle directly above the inner wall. The gas is thus forced over such wall to the heating chamber. After the gas has done its work it passes into the checker-work at the other side of the furnace, and is finally led off to the stack. After a certain interval the air-valve is reversed, the gas is turned off from one side and turned on at the other side, and the operation just described is repeated.

A machine for forming and welding pipes at one heat has been patented by G. Russell and D. R. Wood, of McKeesport, Pa. The heated blank is received from the furnace by a pair of forming rolls, which deliver it to a tapering helical guide-tube. The welding ball consists of an oblong block of metal,

round in cross section and of a diameter corresponding to the inside diameter of the pipe to be made. Within the guide tube the formation of the pipe is completed, and it is welded along its seam by the welding ball and by a pair of welding rolls located at the opposite end of the tube. The welding ball is easily removed from its supports, and permits the speedy operation of the machine and the substitution of one ball for another. A feeding device consisting of gripping tongs fixed to a carriage which runs on rails set at each side of an endless chain serves to draw the pipe through the welding rolls.

Information on Labor.

The Secretary of the Interior has approved the outline of information proposed to be obtained through the special agents of the Bureau of Labor Statistics shortly to start for Europe. These embrace the following subjects:

1. The opinions of leading merchants, bankers, manufacturers and workmen as to the causes of depression and the facts upon which they have based them.
2. The effect in all directions of the employment of imported labor under contract—first, upon the labor employed before the employment of the imported contract labor; second, upon the imported contract labor itself; third, upon the consumers of the goods or material produced by such imported labor; fourth, upon the employers of the contract labor.
3. Whether the employment of imported contract labor has reduced the wages of the old labor, and what other influences it has had upon them.
4. Whether imported labor is paid less wages than the old, and whether the condition of the imported laborer has improved from what it was when such laborer was imported.
5. Whether the price of goods or material produced by the imported labor has been reduced to the consumer.
6. Whether the employer of such imported labor has increased or decreased his profits thereby.
7. In what industries and to what extent foreign capital is employed in developing the industries of your locality.
8. The labor cost of the product of each of the leading industries to the extent of 10 or 12 such industries.
9. The composition of labor in certain establishments.
10. The cost of the plant or whatever constitutes the mechanical force and the production for some well-defined unit of time.
11. The exact rate of wages per hour for each class or employee in such establishments, and, if possible, in the leading industries, and as exactly as circumstances and facts will admit the apparent displacement of muscular labor through the use of machinery.
12. The average cost of clothing for adults, male and female, and for children per annum.
13. The average quantity of fuel (naming the kind) for a family per annum and the number of fires; the number of weeks in a year it is necessary to use fuel for warmth, and also the composition of the diet, for a few representative families in each of the leading industries, the size and composition of family to be given in all cases.
14. The actual ration per day, per week, or for any unit of time of a workman's family.
15. The exact quantity and cost of each article of food consumption for a given number of persons, specifying adults and children.
16. The character of the housing of the people employed in the various leading industries; whether the housing is commodious or otherwise, whether in brick, stone, or wooden houses.
17. A general statement as to the race and nationality of the people employed in each of the leading industries, and what progress, if any, has been made by the people of different nationalities employed.

THE WEEK.

A French company of engineers have contracted to build a breakwater in the harbor of Vera Cruz, to cost \$10,000,000, and the Government is in treaty for the construction of several lighthouses on the coast.

Chief Engineer Shay, of the New York Fire Department, again speaks of the exposed condition of property on the river front, from Fourteenth street to the Battery. As fire raging in the freight sheds must necessarily be fought from boats on the river, the city is liable to a sweeping disaster.

The machinery to be employed for the recovery of Spanish treasure in Vigo Bay is being prepared in Philadelphia. The method of raising the submerged treasure-galleons is to remove the mud with which they are covered by means of huge pumps and then to slip chains underneath, and, by means of 20 big hydraulic jacks on pontoons, raise the vessels, as was done with the Tallapoosa. They will be floated to the shore by the tide. It is expected to get enough brass from the many cannon with which the fleet was armed to pay for the expedition.

The enormous extent of the American cattle trade is shown by a paper recently read by Mr. Loring, Chief of the Agricultural Department. More than two-thirds of the total number of horned stock are in the States west of the Mississippi, Texas having 4,945,201 head; Iowa, 3,040,887; Missouri, 2,009,647; and Kansas, 2,007,612. The exports of beef for 1884 were 120,784,064 pounds fresh, and 43,021,074 pounds salt, the total value, including the tinned beef, the quantity of which is not given, being \$18,431,000, or about \$1,800,000 more than in 1883. The number of cattle exported was 190,518, as against only 104,444 in 1883, and 360,000 head of cattle were killed for salting down.

Dr. John E. W. Thompson, of this city, the new Minister to Hayti, is a graduate of Yale College and one of the most accomplished colored men in the United States.

Capt. C. T. Russell, the recently-appointed United States Consul to Liverpool, sailed for England last Saturday.

The manufacturers of Manchester and Lancashire attach high importance to the scheme of a railway between British Burma and Southwest China, which, they believe, will develop one of the largest markets for the piece-goods trade. The proposed route is through Siam.

The General Term of the Supreme Court has confirmed, conditionally, the report of the commissioners in favor of the construction of a railroad in Broadway, between the Battery and Fifteenth street, by the Broadway Surface Railroad Company. Judge Davis, in a dissenting opinion, says: "On general principles I think no surface railway should be constructed in Broadway. There are vast interests to be considered on that question besides those of the railroad corporation and of the owners of property along the street. * * * Broadway between the points of the contemplated railroad is the central street of a narrow island, and is rapidly becoming absorbed by that kind of business which most demands facility for transporting merchandise and property rather than persons. Its chief traffic must hereafter be with the country instead of the city, or, in other words, a wholesale and not a retail trade. Its great value as a retail shopping street has departed, and efforts to force it back will be as powerless as the commands of Canute."

The New York Sun, as an advocate of a silver basis of valuation rather than gold, foresees the time not far distant when gold will be at a premium, and advises the United States Treasurer to avail himself of a chance for profitable speculation without further delay. The editor says: "It looks very much as if Secretary Manning was unnecessarily giving away to the banks millions of dollars of gold at par which in a comparatively short time will command a premium. The premium will not, it is true, be so large as many people expect it to be, but it will amount to something, and the Treasury ought to have the benefit of it. The law allows the nation to pay its obligations in silver dollars, and there is no express nor implied agreement on its part to pay in gold. Retaining silver, therefore, and paying out gold, is an indefensible squandering of the national resources."

To illustrate the increased value given to a product by labor, an exchange cites the following example: A piece of steel bar, square, 3/4 inch diameter and 2 inches long, worth perhaps 1/2 cent, can be increased to more than 40 times its initial value by labor. A single blow of a drop hammer on the heated steel punches the central portion against the sides and forms the steel into a hollow parallelogram; another blow forms the outside, so that the squared ends become rounded or shaped like the bows of a boat; a final blow completes the shape into that of a sewing-machine shuttle. The forging is then placed in a die under a powerful press to compact its substance, is finished on a buff wheel, is drilled, fitted with a tension spring, and is ready for sale, bringing at wholesale from 20 to 30 cents.

The proposed ship railway, 17 miles in length, to connect the Bay of Fundy with the Gulf of St. Lawrence, will enable ships to reach St. John from Montreal or Quebec without sailing around the dangerous coast of Nova Scotia.

Western competition has nearly driven broomcorn out of the Mohawk Valley.

The large four-masted iron sailing ship "Falls of Erin" arrived at this port a few days ago from Calcutta, and is much admired. She was built by Russell & Co., of Port Glasgow, Scotland, who have contracted to build for the same owners a four-masted steel ship of 3500 tons register. She is 331 feet long over all, 41 feet wide and about 36 feet deep. Her lower masts and top masts are made of steel boiler plates while the topsail and course yards are of iron, and the decks are of iron fore and aft. We now have only four iron sailing vessels under the American flag, but there is reason to hope all our principal builders will soon provide themselves with plant for working in metals.

The domed and mastless steamer Meteor, which was to astonish the world in crossing the Atlantic, is to be employed for towing purposes on the Kennebec.

Advertisements have been issued from the Navy Department for plans and proposals for the construction of two cruisers of not less than 3000 nor more than 5000 tons displacement, costing, exclusive of armament, \$1,100,000 each; one heavily-armed gunboat of about 1600 tons displacement, costing, exclusive of armament, not more than \$520,000, and one light gunboat of about 800 tons displacement, costing, exclusive of armament, not more than \$275,000. Secretary Whitney construes the law as authorizing the invitation of new designs in addition to those heretofore made.

The Federation of the Window Glass Workers of the World will meet in annual convention in Pittsburg on Monday, July 13. Delegates will be present from Italy, France, Belgium, England and Germany.

The new steamer Haytien Republic was a surprise to her owners, who contracted for a 9-knot steamer on a stated amount of fuel. The builders furnished one that made 12 knots easy on her trial trip. The hull was built by the New England Company and the engines by the Goss Marine Iron Works, of Bath, Me.

The Sound steamer Pilgrim received a high compliment from Bryce Douglas, of the firm of John Elder & Co., the Clyde ship-builders. To a reporter he said, after making a trip in her: "I think I have been impressed more with your river and Sound steamers than with anything I have seen. We have nothing in Europe that can be compared with the Pilgrim. She is more than a steamer. She is a first-class floating hotel, and yet she is not less than a steamer, for I don't suppose that her engine can be surpassed in the world."

Director General Burke, of the New Orleans Exposition, says: "The knowledge imparted of our country's progress and resources, the impulse given new industries in the South and the effect on trade with Mexico and Central America have paid all losses tenfold. The Exposition has solved the race problem for the South, promoted the cause of education, and will start into life a thousand new industries. In the face of such results it is unfair to quibble about a few thousands of dollars apparently lost."

Officers of the United States Coast Survey, directed by Prof. J. E. Hilgard, superintendent, have commenced the work of surveying New York Harbor. There are many hidden rocks in the channels of the North and East rivers very dangerous to navigation not laid down the charts. So in regard to shoals. The accumulations of matter dumped in by careless contractors and others removing the rubbish from the streets of the city have very largely changed the natural features of the channel beds. In a word, the channels have so greatly changed during the past 30 years as to have become a serious obstacle to vessels entering or departing from the harbor. New York's commercial supremacy was becoming, in the eye of merchants, imperiled. To effect a remedy \$30,000 was appropriated by the last Congress, and, in order to carry out the designs of that body and the general wishes of the country, the Coast Survey are making vigorous efforts to ascertain the present condition of the harbor and its approaches, and have therefore inaugurated a scheme of survey that will be as nearly complete and general as science may permit.

The award of \$15,000 damages to Rufus Story as against the New York Elevated Railroad Company is reversed after eight years of litigation.

The South American Commissioners at last accounts were in Santiago.

The Goss Marine Iron Works, of Bath, Me., have passed into possession of the New England Shipbuilding Company, who will probably add an iron plant at an early day.

The Havana Official Gaceta states that the number of vessels that entered the ports of Cuba in February was 316, with a total tonnage of 224,000. The revenue left in the custom house by these vessels amounted to \$733,534. In February of 1884 the vessels entered numbered 330, their tonnage was 238,960, and the revenue derived from them was \$946,098.

Asbury Park, N. J., will be supplied with water this summer by sinking five wells and laying 30,000 feet of pipe, at a cost of \$30,000.

The Pratt & Whitney Company, of Hartford, Conn., one of whose manufactures is the improved Gardner machine gun, have just been notified by the Italian Government that the weapon has been adopted by that power after a competitive trial of the principal machine guns of the world. The notification is accompanied by an order for 100 guns, to be delivered within a year.

The three tall sheet-iron chimney stacks at the boiler-house of the New Orleans Exposition buildings blew down, causing a general wreck.

A telegraph cable, equal in dimensions to a fire hose, has been laid underground in the streets of Chicago, extending from the Western Union building to the new Board of Trade rooms. The cable has an aggregate weight of 7 1/4 tons, and is composed of 61 conductors—separate wires, all intertwined and yet all conveying separate currents of electricity. "There is now underground on La Salle street the biggest conglomeration of telegraph and other electric wires anywhere in the world, I believe," said the expert. "There are in all 249 separate wires, besides those put down by the city electrician."

The Storm King bridge scheme has been defeated in the legislature.

Engineer-in-Chief Greene, of the Dock Department, has put a large force of men to work upon the new municipal pier, near Castle Garden, for which the Legislature, a year ago, appropriated \$100,000.

The New Orleans Times-Democrat says Mexico thoroughly realizes the purposes and aims of the Exposition. She is making by her exhibits new markets for her goods; but, not satisfied with that, she wishes to reap all the advantages that the Exposition has disclosed to her and to profit by all the latest discoveries, the newest patents, machinery, &c. To this end the Government undertakes to act as an agent for the exhibitors, and to distribute information about their goods throughout the Mexican Republic.

Two or three contracts of some importance were awarded in Pittsburg last week by the Water Department. The bidders for supplying 31 single and 70 double fire plugs were J. R. Hutchinson, the Ludlow Valve Mfg. Co. and the Chapman Valve Company. The Ludlow Company bid \$23.94 on the single plugs and \$45.75 on the others. They were the lowest bidders and were awarded the contract. Boyle & Scanlon bid at the following prices for laying water-pipe: 3792 feet of 4-inch, 14.968 feet of 6-inch and 6188 feet of 8 inch at 22 1/2 cents; 1404 feet of 10-inch, 4560 feet of 12 inch, 1916 of 14-inch and 1956 feet of 20 inch at 30 cents. They were given the contract. The other bidders were C. Howard & Son, Theodore Heilmann, Booth & Flinn, P. Moran and Eugene Scanlon. Eugene Scanlon bid 24 cents on the 4-inch pipe and 25 cents on the rest. Some figures ran very high.

A number of steamship men and inventors assembled in a machine shop in York street, Brooklyn, on the 6th inst., and watched the workings of an automatic steering apparatus constructed for the United States steamer Dispatch. The tiller-wheel chains are worked by a cylinder which has communication with a compressed-air supply chamber. The workings of the cylinder are governed by electricity, and can be controlled from the pilot-house or by the officer on the bridge. There is a tell-tale mechanical compass attached to the steering gear. This, when set to the course ordered, will ring a vibrating bell placed in the Captain's room should the vessel deviate from that course from any cause. The apparatus is noiseless, and the exhaust air can be used for ventilation between decks and in the fire rooms of steamers. Two 600-pound weights were attached to ropes running on large pulleys as a substitute for a tiller chain. These were lifted and lowered with ease. The new steering machine will be placed on board the Dispatch this week.

Touching the much vexed question of diverting freight from direct routes in the interest of railway managers, Judge Donohue last week made an order in the Supreme Court, enjoining the New York, Lake Erie and Western, and connecting roads. The plaintiffs charge that the Erie Company have been diverting traffic, contrary to the terms of the Great Western Dispatch contract, and, further, that they are appropriating and retaining to their own use money belonging to the Chicago and Atlantic Railway Company. The roads to which it is said the Erie Road diverted the traffic are named as the Pittsburg, Fort Wayne and Chicago and the Chicago, St. Louis and Pittsburgh railroads.

The Wason Car Company, of Springfield, Mass., have received a contract for \$100,000 worth of cars for Panama.

The new Governor of Alaska is A. P. Swineford, of Marquette, Mich., editor of the Mining Journal.

A cable dispatch says the Government of China will soon begin to employ Europeans to work their coal mines. Now that China has commenced to utilize steam the advantages of working her own inexhaustible coal mines are beginning to be appreciated. These coal deposits are chiefly upon the banks of the Yangtze Kiang river. According to the old tradition, extracting the coal would make terrible mischief by disturbing the earth's equilibrium.

The largest vein of gas ever struck in Ohio was reached last week at a depth of 480 feet, at Shelby. The gas rushed from the orifice with a tremendous report, shattering the derrick and throwing dirt and mud many feet into the air. A pipe 70 feet in length has been connected with the well, and it furnishes a flame of fire 25 feet high.

Over 500 delegates, representing commercial bodies in all the principal States in the Union, have accepted invitations to the National Commercial Convention to be held in Atlanta, Ga., 19th, 20th and 21st inst. Addresses will be delivered by S. Dana Horton, of Ohio; ex-Governor Stannard, of Missouri; ex-Senator Gordon, of Georgia; J. O'Donnell, of New York; William M. Burwell, of New Orleans; Gen. A. R. Lawton, of Georgia; S. F. Covington, of Cincinnati, and Gen. Robert Toombs.

About \$100,000 was sunk in attempting to establish a line of steamers between Eastport, Me., and Nova Scotia.

A suit in equity was commenced against the Siemens-Anderson Steel Company, in the Court of Common Pleas, Philadelphia, on the 6th inst., by the Merchants' and Mechanics' Bank of Pittsburgh, to recover over \$300,000, money loaned. The plaintiffs allege that the agents of Mr. Siemens, Richmond & Potts and the other defendants entered into an arrangement in February, 1881, for the organization of the Siemens-Anderson Steel Company; that the company were organized in such a way that they started business with a mortgage debt of \$1,500,000 incumbering all their assets, and with a capital of \$1,500,000 divided into 15,000 shares of \$100 each, which purported to be full-paid shares, whereas, in fact, the said shares were not full paid, nor had the said Siemens-Anderson Steel Company received any money in payment therefor, and that, in consequence of this "mortgage debt of \$1,500,000, and having no actual cash capital, were unable to do a profitable and successful business, and in the year 1882 the said Siemens-Anderson Steel Company became insolvent, its insolvency being caused by and resulting from the want of actual cash capital." The mortgage was foreclosed, the bill says, and all the property of the Steel Company was sold out for the benefit of the bondholders, and the plaintiffs got nothing. The basis of the bank's claim is that the stock of the Steel Company was not "full paid stock," and that the organization of the company was "a fraud upon all persons who became creditors of the said Siemens-Anderson Steel Company."

A recent sale of 30 shares of the Bertha Zinc Company, of Martin's, Va., was effected at par, or \$100 per share.

In the month of April the Scranton Steel Company produced, running single turn, with its two converters no less than 6928 tons of ingots.

Anthracite coal is costing North River furnaces about \$3.50 per ton.

Engineers who claim to be backed by capitalists in New York propose a grand scheme for supplying water to Philadelphia by erecting, 7 miles above Fairmount, on the Schuylkill river, a dam 165 feet in height sufficient to transform the entire valley as far as Reading into an immense reservoir.

The new building of the New York Mercantile Exchange, now approaching completion, will cost \$200,000.

The Secretary of the Navy, in inviting proposals for the construction of new steam cruising vessels, calls for "the best and most modern designs, having the highest attainable speed," all plans to be submitted within 60 days after the 15th inst., and, in case any such plan be adopted or used, a liberal compensation will be allowed.

A dispatch from the City of Mexico says several Mexican States have united in a request to the Government for the formation of a commission to secure free duties with the United States, or in some way to bring about a treaty of commercial reciprocity. If the Government shall fail to effect a treaty, they threaten to extend the zone of free interior duties in Mexico, as relates to their States, to the City of Mexico. Business at the capital is represented to be slowly improving.

An increased acreage of cotton is being planted in the Southwestern States, estimated at 4 1/2 per cent. compared with last year.

The Importers' and Grocers' Exchange, of this city, will probably be disbanded, for lack of business.

Edward O. Graves, Assistant Treasurer of the United States, will become Chief of the Bureau of Engraving and Printing on the 1st day of June, vice Captain Burrill, resigned.

Arrangements are being made for resumption of work on the Hudson River Tunnel on the Jersey City side of the river by June 15. Contractor Anderson, who began the work, will take control of it again.

Mr. Charles Latimer, President of the International Institute for the Preservation of Weights and Measures, under whose auspices the proposed expedition of scientific men to Egypt for the examination and measurement of the Great Pyramid will be made when enough funds are secured, says: "Our plan on reaching the Great Pyramid is to remove

all debris to the foundation, and see what will thus be laid bare. We will also proceed in the same way with the Sphinx, and believe that it will be found to have some grand and special symbolical connection with the pyramid. We hope eventually that the great powers of the world may be led to include the territory of these great wonders in an international park, to be preserved for the use and knowledge of mankind. We believe that the Great Pyramid is not merely a huge stone tomb to hold the dust of Kings, but that it is a record in stone of the history of the world and of mankind—of the future as well as of the past. It is inspired in its lesson, even as Holy Writ is inspired in verse and word."

Speaking of the new Mexican tariff, the Mexican Financier, just received, says: "A consideration which must have its effect in stimulating the importation of goods from the United States during the next six weeks by business houses importing largely from the Western and Eastern cities is the generally entertained belief that the present low rates of freight on American lines to El Paso cannot last long. This consideration, taken with the other already mentioned—that the new tariff will largely increase duties in many cases—will probably have for its result an augmentation of importations."

The new shops of the West Shore line at Frankfort, N. Y., a place which was lately an obscure hamlet, are said to be admirably arranged and appointed for repair service, and planned with a view to car and boiler construction in the future. The planing mill, roundhouse, foundry, erecting shop, blacksmiths' shop and paint shop are filled with approved machinery and appliances for the work required. At present there are nearly 400 men employed in these shops and at the roundhouse.

The Erie Canal was opened to navigation on Monday, but the boatmen and shippers are not expecting a profitable season, as the low rates of freight on railroads will prevent anything being carried by water which would be at all in danger of damage, or which would reach market in a better condition.

Consul Simpson, of Puerto Plata, San Domingo, says that business the past year has not been satisfactory, although its volume was somewhat greater than for 1883. Tobacco shows a falling off of 1,702,596 pounds, and sugar an increase of 2,074,156 pounds. The low price received for these two articles, sugar especially, has been a great drawback. American tonnage shows a decrease of 1,445.56 tons.

A Spanish line of steamers between this port and Barcelona is about to go into operation. The pioneer steamer Herman Cortes is loaded with flour, cotton, agricultural implements, &c., and will sail this week.

Zebulon Butler, aged 47 years, an ingenious machinist and practical inventor, died at Wilkesbarre, Pa., on Monday.

The cable reports Earl Granville as making an important statement in the House of Lords on Monday evening, viz., that an arrangement perfectly satisfactory to England, Russia and the Earl of Dufferin, Viceroy of India, had been made in reference to the Afghan frontier.

The French Government has promulgated a higher range of duties for the Island of Martinique, and the London Economist says this action will no doubt be followed by similar restrictive tariffs in the other colonies. The duties on some articles are specific, and on some ad valorem, but in most cases they range from 10 to 20 per cent. or more. In some cases they are absolutely prohibitory.

The newly-appointed city chamberlain, Wm. M. Ivins, entered upon the duties of his office last Monday.

The British War Secretary says the Nile railway will be completed as a commercial enterprise.

The White Cross Line steamer Helvetia, belonging to an Antwerp firm, was crushed by ice and sunk off the coast of Cape Breton, on May 8; all hands were saved; the cargo was valued at \$400,000.

The Pennsylvania Railroad Company continue their experiments with lighting their cars by electricity from Brush storage batteries. They use the lights on a train running between Altoona and Pittsburgh, and the arrangement has worked satisfactorily. The storage batteries are charged in the company's shops by connection with a Brush dynamo-electric machine. It takes about nine hours running to charge the batteries with sufficient electricity for the round trip. The intention is, should the plan be found advisable for general use on through trains, to establish electric plants at different stations for charging the batteries.

The Warwick Furnace, under the management of Mr. E. S. Cook, continues to beat its own record. For the week ending May 9 it produced 615 1/2 tons of pig iron with a fuel consumption of 19 1/4 cwt.—one-quarter coke and three-quarters anthracite—this being 2 tons of iron more, and 1/2 cwt. less of fuel than the previous best week. The average for the last 10 weeks is 578 tons of iron, with a fuel consumption of 23 1/2 pounds of fuel per ton of iron of 2268 pounds.

The management of the Bellaire Nail Works, failing to come to satisfactory terms with the Amalgamated Association committee regarding the starting of the steel works, have decided to close down their factory and blow out their furnace on Saturday, May 16. Four hundred men will be thrown out of employment for an indefinite period.

THE Iron Age Directory

Index to Advertisements.

Addressed Envelopes and Wrappers.	Page.
Bar E. W. & Co., Chicago, Ill.	44
Agricultural Implements.	
Rock Island Plow Co., Rock Island, Ill.	4
Air Compressors.	
Clayton Steam Pump Works, Brooklyn, N. Y.	46
Norwalk Iron Works, Norwalk, Conn.	40
Air Brakes.	
Westinghouse Air Brake Co., Pittsburgh, Pa.	4
Alarm Money Drawers.	
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.	37
Anti-Friction Metals.	
De Plaine E. & Co., Chicago, Ill.	48
Stevens Paul S., Philadelphia, Pa.	48
Asbestos.	
The Asbestos Packing Co., Boston, Mass.	14
Chalmers-Spence Co., 419 8th St., N. Y.	9
Axles and Bits.	
Jennings C. & Co., 96 Chambers, N. Y.	29
Bates, Wilson & Co., 294 Broadway, N. Y.	14
Axles, Springs, &c., Manufacturers of.	
Cook R. & Sons, Winsted, Conn.	13
Gautier Steel Dept. of Cambria Iron Co., Johnstown, Pa.	38
Liggett Spring & Axle Co., Pittsburgh, Pa.	8
Wurster F. W., Brooklyn, N. Y.	48
Axes.	
Mann W. Jr. & Co., Lewistown, Pa.	3
Peck A. G. & Co., Cohoes, N. Y.	48
Bankers.	
P. W. Galland & Co., 2 Wall, N. Y.	9
Bar Iron.	
Virginia Nail and Iron Works Co., Lynchburg, Va.	14
Barb Wire & Fence.	
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.	38
Hawke Eye Steel Barb Fence Co., Burlington, N. Y.	2
Lowell Barb Wire Co., Reading, Pa.	2
Washburn & Moen Mfg. Co., Worcester, Mass.	2
Barb Wire Fence Guards.	
Seidell Barb Wire Fence Guard Co., Philadelphia, Pa.	26
Bellevue, Manufacturers of.	
Bellevue T. H., Cleveland, O.	14
Scout Geo. M., Chicago, Ill.	10
Bells (Sleigh).	
Reynolds Mfg. Co., Easthampton, N. Y.	10
Belting, Makers of.	
Alexander Bros., 412 N. 3d, Philadelphia, Pa.	30
Atlanta Rubber Co., Atlanta, Ga.	30
Stannell Rubber Co., Philadelphia, Pa.	30
S. Y. Belting & Packing Co., 13 & 15 Park Row, N. Y.	13
Bicycles.	
Pope Mfg. Co., 507 Washington, Boston, Mass.	48
Bird Cages, Makers of.	
Linton O. & Co., 254 Pearl, N. Y.	3
Maxwell John, 247 and 249 Pearl, N. Y.	7
Bit Braces.	
Amidon & White, Buffalo, N. Y.	43
Ives W. A. & Co., New Haven, Conn.	47
Millers Falls Co., 74 Chambers, N. Y.	40
Sutton E. R., Buffalo, N. Y.	39
Blind Axle Fixtures.	
North F. O. & Co., Boston, Mass.	33
Blocks, Tackle, Makers of.	
Bagnall & Lomb, Boston, Mass.	47
McKay & Sanders, 20 Warren, N. Y.	42
McMillan Wm. H., 113 South, N. Y.	41
Penfield Block Co., Lockport, N. Y.	41
Shubert & Cottingham, Philadelphia, Pa.	11
Boiler, Compound.	
Crescent Mfg. Co., Cleveland, O.	14
Boiler Feeders.	
Automatic Injector Co., Cleveland, O.	45
Boilers, Steam.	
Babcock & Wilcox Co., 30 Cortlandt, N. Y.	12
De Moor Iron Co., Liberty, N. Y.	15
Harrison Boiler Works, Philadelphia, Pa.	15
Wetherill Robt. & Co., Chester, Pa.	47
Boiler Plates.	
Wm. Melvain & Sons, Reading, Pa.	45
The Seidel & Hastings Co., Wilmington, Del.	26
Bolt and Rivet Clippers.	
Chalmers, Brother & Co., Philadelphia, Pa.	4
Bolt Cutters.	
Acme Machinery Co., Cleveland, O.	13
Howard Iron Works, Buffalo, N. Y.	45
Sellers Wm. & Co., Philadelphia, Pa.	47
Liberty, N. Y.	47
Wells Bros. & Co., Greenfield, Mass.	32
Wiley & Russell Mfg. Co., Greenfield, Mass.	32
Borax.	
Smith, J. P., San Francisco, Cal.	39
Boring Implements.	
Amidon & White, Buffalo, N. Y.	43
Ives W. A. & Co., New Haven, Conn.	47
Boring Machines.	
Lawrence Curry Comb Co., 369 E. 23d, N. Y.	44
Boxes for Hardware.	
Green S. H., 12 Murray, N. Y.	29
Boxes, Shelf.	
Jones Jesse & Co., Phila., Pa.	26
Brass, Manufacturers of.	
Ansonia Brass & Copper Co., 19 Cliff, N. Y.	2
Bridgeport Brass Co., 19 Murray, N. Y.	2
Davol John & Sons, 109 John, N. Y.	2
Holmes, Booth & Haydens, 25 Park Place, N. Y.	2
Plume & Atwood Mfg. Co., 18 Murray, N. Y.	2
Waterbury Brass Co., 290 Broadway, N. Y.	2
Brass Butt Hinges.	
Tiebout W. J., 16 & 18 Chambers, N. Y.	20
Brass Foundries.	
McFarland Wm., Trenton, N. J.	4
Stevens Paul S., Philadelphia, Pa.	48
Brass Goods.	
Waterbury Mfg. Co., Waterbury, Conn.	2
Bridge Builders.	
Moseley Iron Bridge & Roof Co., 5 Dey, N. Y.	42
Union Bridge Co., 18 Broadway, N. Y.	38
Buckets, Pump and Elevator.	
Iron Cast Mfg. Co., 22 Cliff, N. Y.	48
Builders' Hardware.	
Manhattan Bldg. Co., Reading, Pa.	44
Nimick & Harrison Mfg. Co., Pittsburgh, Pa.	20
Penn Hardware Works, Reading, Pa.	14
Whitney A. & Sons, Philadelphia, Pa.	8
Butcher and Shoe Knives, Manufacturers of.	
Wilson John, Sheffield, England	10
Butts and Hinges.	
Chicago Spring Butt Co., Chicago, Ill.	43
New England Butt Co., Providence, R. I.	42
Sabin Machine Co., Montpelier, Vt.	42
Smith & Edge Mfg. Co., Bridgeport, Conn.	47
Stanley Works, New Britain, Conn.	39
Union Mfg. Co., 96 Chambers, N. Y.	7
Car Axles.	
Roberts A. & P. & Co., 265 S. 4th, Phila.	5
Carpet Stretchers.	
The K. & W. Mfg. Co., Chillicothe, Ohio	26
Car Wheels.	
Knoxville Car Wheel Co., Knoxville, Tenn.	10
Union Foundry & Pullman Car Wheel Works, Chicago, Ill.	8
Whitney A. & Sons, Philadelphia, Pa.	8
Carriage Bolts, Makers of.	
Norwich Bolt Works, Norwich, Conn.	12
Townsend, Wilson & Hubbard, Phila.	45
Carriage Hardware, Makers of.	
E. D. Clapp Mfg. Co., Auburn, N. Y.	6
Smith H. D. & Co., Plainville, Conn.	12
Woodruff, Miller & Co., Mount Carmel, Pa.	15
Union Nut Co., 96 Chambers, N. Y.	28
Castings, Iron.	
S. Cheney & Son, Manlius, N. Y.	30
Levin Thos. & Co., Philadelphia, Pa.	7
Haight & Clark, Buffalo, N. Y.	14
Hammer & Co., Branford, Conn.	14
North Brothers, Philadelphia, Pa.	5
Syracuse Mfg. Co., Syracuse, N. Y.	4
Wetherill Robt. & Co., Chester, Pa.	47

Castings, Steel.	
Pureka Cast Steel Co., Chester, Pa.	48
Flage Stanley G. & Co., Philadelphia, Pa.	48
McIntosh & Co., Spuyten Duyvil, N. Y.	48
MacIntosh & Co., Philadelphia, Pa.	48
Pittsburgh Steel Casting Co., Pittsburgh, Pa.	48
Standard Steel Casting Co., Thurlow, Pa.	6
Chairs.	
Bradley & Co., 816 Richmond St., Phila.	45
Wm. H. Haskell Co., Pawtucket, R. I.	45
Cheese Saws.	
National Wire and Iron Co., Detroit, Mich.	3
Chemists.	
Haines R., Philadelphia, Pa.	5
Chemicals.	
Elmer & Amend, 265 Third av., N. Y.	41
Cherry Stands.	
Enterprise Mfg. Co., Philadelphia, Pa.	42
Chisel, Manufacturers of.	
Buck Bros., Millbury, Mass.	13
Chucks.	
Ives W. A. & Co., New Haven, Conn.	47
Smith & Edge Mfg. Co., Bridgeport, Conn.	47
Union Mfg. Co., 96 Chambers, N. Y.	7
Clock Springs, &c.	
Dunbar Bros., Bristol, Conn.	7
Clothes Dryers.	
Hill Dryer Co., Worcester, Mass.	10
Coal.	
Borden & Lovell, 70 West, N. Y.	4
Pardee A. & Co., 111 Broadway, N. Y.	4
Coffee and Spice Mills.	
Enterprise Mfg. Co., Philadelphia, Pa.	42
Laure Bros., Poughkeepsie, N. Y.	39
Coke.	
Schoonmaker J. M., Pittsburgh, Pa.	42
Colters.	
Geo. K. Oyer Mfg. Co., St. Louis, Mo.	42
Copper.	
New Haven Copper Co., 290 Pearl, N. Y.	2
Copying Presses.	
Ohl Geo. A. & Co., Newark, N. J.	47
Cordage.	
Elizabethport Steam Cordage Co., 48 South, N. Y.	30
Cork Screws.	
Howe Bros. & Hulbert, West Winsted, Conn.	14
Corrugated Iron.	
Cincinnati Corrugating Co., Cincinnati, Ohio	42
Moseley Iron Bridge & Roof Co., 5 Dey, N. Y.	42
Cotton Presses.	
Mecklenburg Iron Works, Charlotte, N. C.	34
Coverings, Boiler and Pipe.	
Chalmers-Spence Co., 419 Eighth, N. Y.	9
Crankshafts.	
Seidell R. B., Philadelphia, Pa.	43
Cupolas.	
Smith & Sayre Mfg. Co., 245 E. way, N. Y.	47
Curry Combs.	
Detroit Elbow Co., Detroit, Mich.	35
Lawrence Curry Comb Co., 369 E. 23d, N. Y.	44
Muncie Novelty Co., Muncie, Ind.	34
Cutlery, Importers of.	
Clatworthy F. & W., 82 Chambers, N. Y.	10
Cutlery, Manufacturers of.	
Northfield Knife Co., Northfield, Conn.	6
McKnight & Williams, 288 Greenwich, N. Y.	4
Dog Collars.	
DeFord Family Goods Co., 101 Chambers, N. Y.	35
Door Checks and Springs.	
Shaw Door Check & Spring Co., Boston, Mass.	10
Door Hangers, House and Barn.	
Coches Iron Foundry and Machine Co., Liberty, N. Y.	15
Lane Bros., Poughkeepsie, N. Y.	42
Stearns, E. C. & Co., Syracuse, N. Y.	48
Sherman Mfg. Co., Chicago, Ill.	47
Terry Mfg. Co., Housatonic, N. Y.	14
The Mack Door Hanger Co., Housatonic, N. Y.	14
Door Latches.	
Van Wagener & Williams Co., 82 Beek, N. Y.	48
Draw Knives.	
Wilkinson A. J. & Co., Boston, Mass.	45
Drill Bits.	
Millers Falls Co., 74 Chambers, N. Y.	40
Drilling Machines, Makers of.	
Wiley & Russell Mfg. Co., Greenfield, Mass.	32
Drills.	
Elliot Sterling, Newton, Mass.	46
Drop Forgings.	
The Billings & Spencer Co., Hartford, Conn.	3
William Rose & Bros., West Phila., Pa.	47
Williams J. H. & Co., Brooklyn, N. Y.	45
Drop Presses.	
Stiles & Parker Press Co., Middletown, Conn.	48
Williams, White & Co., Moline, Ill.	42
Dust Pans.	
Steel Edge Dust Pan Co., Boston, Mass.	30
Eave Trough Hangers.	
Heartley Geo. W., Toledo, O.	32
Edge Tools, Makers of.	
Doscher M., 25 Chambers, N. Y.	40
White L. & J., Buffalo, N. Y.	42
Elevators, Makers of.	
Morse, Williams & Co., Philadelphia, Pa.	47
Stokes & Parrish Machine Co., Phila.	46
Emery.	
Walpole Emery Mills, South Walpole, Mass.	26
Engines, Gas.	
Gordon, Strobel & Laureau, Phila., Pa.	5
Engines, Steam, Makers of.	
Cooke & Co., 22 Cortlandt, N. Y.	12
Hicks & Co., Cleveland, O.	47
Mecklenburg Iron Works, Charlotte, N. C.	34
The North Iron Works Co., S. Norwalk, Conn.	40
The Pusey & Jones Co., Wilmington, Del.	39
The Westinghouse Machine Co., Philadelphia, Pa.	47
Wetherill Robt. & Co., Chester, Pa.	47
Expanding Magnets.	
Cooke & Co., 22 Cortlandt, N. Y.	12
Foundries.	
Leonard J. & Co., Philadelphia, Pa.	3
Paxson J. W. & Co., 514 Beech, Phila.	3
S. O. Haverly Foundry Supply Mfg. Co., Cincinnati, Ohio	15
Farming Tools.	
Iowa Farming Tool Co., Fort Madison, Iowa	35
Farmers' Tools.	
Heller & Bros., Newark, N. J.	8
Faucets, Makers of.	
John Sommer's Son, Newark, N. J.	45
McNair & Harlin Mfg. Co., 56 John, N. Y.	45
National Wire and Iron Co., Phila.	3
Faucets, Self Measuring, Makers of.	
Enterprise Mfg. Co., Phila., N. Y.	42
Feed Water Purifiers.	
Hall & Sons, Buffalo, N. Y.	4
Fence Posts and Drivers.	
Over Ewald, Indianapolis, Ind.	37
Fences, Wrought Iron.	
Champion Iron Fence Co., Kenton, O.	26
National Wire and Iron Co., Detroit, Mich.	3
File Recutting.	
Acme Co., Collinsville, Conn.	13
Files and Rasps.	
Harnett G. & H., Philadelphia, Pa.	39
Bradley & Co., Syracuse, N. Y.	8
Madden & Cockayne File Co., Middle town, N. Y.	48
Files, Importers of.	
Barrett & Co., 105 Gold, N. Y.	40
Montgomery & Co., 105 Fulton, N. Y.	40
Moss, F. W. 80 John, N. Y.	40
Files, Manufacturers of.	
Barrett & Co., 105 Gold, N. Y.	40
Diston Henry & Sons, Philadelphia, Pa.	36
Everhart James M., Scranton, Pa.	48
Henderson, Christian, Philadelphia, Pa.	48
McCaffrey & Bro., 1782 & 1784 N. 11th, Phila.	8
McClintock File Co., E. Saginaw, Mich.	8
New Am. File Co., Pawtucket, R. I.	39
Nicholson File Co., Providence, R. I.	8
Paul Chas. R., Williamsburg, N. Y.	8
Union File Co., Baltimore, Md.	8
Fire Bricks, Makers of.	
Borgers & O'Brien, Philadelphia, Pa.	42
Gardner James, Pittsburgh, Pa.	42
Kreischer R. & Sons, Foot & Houston, N. Y.	42
Newton & Co., Albany, N. Y.	42
Ostrander James & Son, Troy, N. Y.	42
Stevens & Ponton, Birmingham, Ala.	42
Union Mining Co., Philadelphia, Pa.	42
Valentine M. D. & Bro., Woodbridge, Conn.	42
Forges, Portable, &c.	
Barrett & Co., 105 Gold, N. Y.	40
Buffalo Forge Co., Buffalo, N. Y.	48
Bullock T. H., Cleveland, O.	14
Emrie Portable Forge Co., Chicago, N. Y.	4
Fairbanks & Co., 311 Broadway, N. Y.	43

See what also proceed, and have some connection with the history of the future in its inspired in the present lines to El consideration, mentioned, increase have for "portations," line at was lately admirably service, and boiler planning shop, are filled for there are shops and navigation of shippers on, as the prevent which image, or a better data, San last year its vol- for 1885, 7,025,590 2,074,156 For these been a ge shows reen this into oper- tors cultural im- an ingen- tor, died as mak- house of an at- England, ceroy of to the purgated land of simi- colonies, istic, and they use In berlain, uties of the Nile commercial elvetia, ured in Breton, cargo any con- their late run- and tority, in Brush about teries and trip, found rains. Terent manage best May with a harter —this est. week. 2213 hands Nail terms steel their on in-

Special Notices.

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10 in. x 6 ft. Engine Lathe. Ames. Good order.
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 One Universal miller. Brown & Sharpe.
 One Milling machine. " Doole.
 " " Brainard.

No. 2 Garing.
Four No. 2 Millers, P. & W. Nancy Pattern, N.Y new.
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For Sale.

Will sell cheap for cash and time payments, or will
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Following machinery, subject to inspection before purchase

- Train of Lauth's 24 in. 3-high Rolls.
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- Train of 20 in. Soft Rolls and Duplicate Rolls.
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Large Engine, 32 x 42, horizontal, 20-ton fly, doubly braced, 12 in. fire.
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Plate Shear to shear as high as $\frac{3}{4}$ in. Plates.
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Scrap Shear.
Scrap Shear and Engine.
Large Sturtevant Blower and Pipe.
Turnace Plates for 4 Charcoal Fires, incl. Incl Valves &c.
Battery of 5 extra flange Fire-box Boilers; also 28 20-hp. Boilers, 12 to 15-hp. Boilers, to operate together or separate, with all connections.
Large Boiler, fire-box metal, 28 ft. by 42 in. or 42 in. by 42 in.
Track Scale, Wagon Scale, Mill Scales, etc., Trams.

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300	tons	R. R. Spiral Spring Steel.
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New first-class Machine Tools at very low prices, combining all the latest and best improvements.

Engine Laths with 6 and 8 foot beds, 16-inch
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Regular sales of Hardware, Cutlery, &c. Sales
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33	33	33	33
35	35	35	35
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36	36	36	36

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WANTED.—position as Chemist in Steel Works; thorough practical experience in analysis of Ores, Coals, Slags, Iron and Steel; furnish good references.
T. ROYER, JR.,
Box 1334, Ann Arbor, Mich.

Trade Report.

New York Iron Market.

American Pig.—The market continues very dull and unsatisfactory. No. 2 Foundry sells at concessions in a number of instances and is still the weakest spot of the market. As an indication of how some regard the business it may be stated that a large furnace company has been urged by a correspondent to "take the bull by the horns" and announce a sweeping reduction on No. 2, a piece of advice which it has promptly declined to follow. We learn that efforts are being made to obtain advances on lots of Southern Iron which have been put into store here, an indication that even at the ordinary liberal concessions no buyers can be found at short notice. We print elsewhere our usual monthly statistics of the number of furnaces in and out of blast. We continue to quote standard brands of Lehigh and North River Irons, tidewater delivery, as follows: No. 1 X Foundry, \$18 @ \$19; No. 2 X Foundry, \$17 @ \$18; Gray Forge, \$16 @ \$17; the outside figure is asked for special brands. Outside brands sell for 50¢ @ \$1 less than our quotations.

Scotch Pig.—Business is exceedingly dull, transactions being limited to very small lots exclusively. Nominal quotations for 5 and 10 ton lots are as follows: Coltness, \$21.50 to arrive; Gartsherrie, \$21 to arrive; Shotts, \$21.50 to arrive, \$22 from yard; Langloan, \$21.50 to arrive, \$22 from yard; Carnbroe and Glengarnock, \$19 @ \$19.50 to arrive, and \$20.50 from yard; Summerlee, \$20.50 to arrive; Dalmellington, \$19 @ \$19.25 to arrive; Eglinton, \$18 @ \$18.50 to arrive; Clyde, \$19 to arrive. For larger lots we quote, nominally, Coltness, \$21.

Bessemer Pig and Spiegeleisen.—We have not heard of any transactions in Foreign material, 20 per cent. Spiegeleisen remaining nominally, \$25.50 @ \$26, 10 per cent. \$21.75, 45 per cent. \$42 and 60 per cent. \$52.50. Foreign Bessemer is, nominally, \$19 @ \$19.25, American Bessemer Pig is dull unchanged.

Bar Iron.—The market has been in a very unsatisfactory condition, and continues weak. We quote, for delivery here, in round lots: Common Iron, 1.45¢ @ 1.55¢; and Refined Iron, 1.65¢ @ 1.9¢, store prices being 1.55¢ @ 1.75¢ and 1.8¢ @ 1.9¢ respectively.

Structural and Shaped Iron.—Small orders almost exclusively are taken, no business of any magnitude having been closed. Angles may be quoted nominally 1.9¢ @ 2.2¢, delivered, for round lots, and Tees at 2.2¢ @ 2.25¢. Store quotations remain 2.2¢ @ 2.4¢ for Angles, and 2.4¢ @ 2.5¢ for Tees. American Beams and Channels are 3¢, from dock, for all orders. Foreign Beams, in round lots, are quoted 2.5¢ @ 2.6¢ for Belgian, and 2.6¢ @ 2.8¢ for German.

Plates.—Business in Plates has been very quiet. Usual prices of Iron Plates are as follows: Common or Tank, 2¢; Refined, 2 1/4¢ @ 2 1/2¢; Shell, 2 1/2¢ @ 2 3/4¢; Flange, 3 1/4¢ @ 3 1/2¢; Extra Flange, 4¢ @ 4 1/4¢. For small lots of Steel Plates the quotations are as follows: Ship, 3¢ on dock; Tank, 2 1/4¢ @ 3¢ on dock; Boiler, 3 1/4¢ @ 3 1/2¢ for Shell, 3 1/2¢ @ 4 1/2¢ for Flange and 4 1/4¢ @ 5 1/2¢ for Extra Flange and Fire-Box.

Sheet Iron.—Some of the makers report that they are fairly busy, others are undoubtedly eager for business. We quote for No. 24, Ordinary grades, in carload lots, 2.55¢ @ 2.65¢ here and 2.85¢ @ 3.8¢ from store, according to quality and finish.

Merchant Steel.—Some of the importers of Steel are beginning to quote prices for delivery at interior points in some specialties. Business generally remains very quiet, and it is frequently claimed is done at a loss. Quotations for the range from Ordinary to Good grades are as follows: American Tool Steel, 7 1/2¢ @ 10¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; Crucible Machinery, 4.5¢ @ 6¢; Spring and Tire, 2 1/4¢ @ 3¢; Open-Hearth Machinery, 2 1/4¢ @ 3 1/4¢, and Bessemer Machinery, 2 1/2¢ @ 2 3/4¢; English Tool, 13 1/2¢ @ 15 1/2¢.

Steel Rails.—With the exception of one lot of 3,000 tons for Western delivery no business of any consequence has been done. A number of the mills will have capacity unemployed for early delivery. We quote, nominally, \$26.50 @ \$27. There has been sharp competition recently on Light Sections, and \$31 has been accepted in one case for New York delivery. Prices are now firmer. The stoppage of the Scranton works, to which we allude elsewhere, is due to the forestalling of a movement on the part of the men to organize a union. The men proposed to stop work suddenly on the 14th.

Steel Wire Rods.—Negotiations are pending for a lot of 500 tons, June delivery. Quotations remain \$39 @ \$40, the market being still unsettled. The duty on No. 5 Wire Rods being .69¢ lb and on No. 6, 45¢ ad valorem; in low prices favor the latter which can be drawn down to No. 10 without annealing. It is estimated that the difference is equivalent to 75¢ @ \$1.00 per ton in favor of No. 6 at present low prices.

Steel Wire Billets.—It is reported that sales have been made on the basis of \$30 at mill for 3-inch Billets, 10 to 20 carbon.

Steel Nail Slabs.—The Pennsylvania Steel Company have recently built a reversing universal mill, with feed tables at both

sides, capable of rolling a 14-inch Ingot down to a 1-inch Slab, square edged. We quote \$31 @ \$32, delivered.

Old Rails.—The market is exceedingly dull at, nominally, \$16.50.

Scrap.—We quote, nominally, \$18.75 @ \$19 from yard.

Rail Fastenings.—Quotations for large lots are 2.6¢ @ 2.65¢ for Bolts and Square Nuts; 2.75¢ @ 3¢ for Bolts and Hexagon Nuts, and 1.6¢ @ 1.7¢ for Splice Bars. Railroad Spikes are quoted 1.8¢ @ 1.9¢.

Messrs. Ely & Williams, 480 Pearl street, Eastern agents of Messrs. Miller, Metcalf & Parkin, of Pittsburgh, are about to issue a circular quoting the great variety of "Crescent" Steels made by that firm.

Philadelphia.

Office of The Iron Age, 280 South Fourth St., PHILADELPHIA, May 13, 1885.

Pig Iron.—There has been only a moderate degree of activity, and the tendency of prices seems to be toward a lower level. This is especially the case with No. 2 Foundry and grades below that, but a similar feeling has been developed in No. 1 Foundry, and on lots of any importance there would be very little difficulty in obtaining concessions, particularly if the order included some No. 2. There can be no doubt that prices, if not already at the extreme bottom, are so near to it as to make any further decline a practical impossibility, but notwithstanding this buyers are as timid as ever, and the entire market is dull and neglected. This feeling of indifference has developed the condition of affairs referred to, which seems likely enough to continue for an indefinite period, or until actual necessities force orders into the market. No one well informed in regard to the trade appears to be basing expectations on lower prices, while all feel sure that much higher prices will prevail eventually; but in the meantime no one buys more than to provide for immediate requirements. The probability is, therefore, that things will remain as they are until there is a general increase in consumption, and how soon that will be is purely a matter of conjecture. The shrinkage has been going on for three years, and as no such financial prostration has been experienced as in former periods of depression, the recovery ought to come so much the sooner; but there are no signs of it yet. Sales of Pig Iron during the week have been at \$15.50 @ \$16, delivered, for Gray Forge, \$16.50 @ \$17 for No. 2 Foundry, and \$18 for No. 1. A few large contracts have been renewed at slightly lower figures than paid in January, but the majority of consumers take only small lots to cover immediate requirements.

Foreign Iron.—There is some inquiry for small lots of special brands of Bessemer at about \$19, with a few sales at a fraction over that, but large consumers are not in the market. Spiegel is wanted, with intimations that \$24.50 would be paid for 3000 to 5000 ton lots of 20%. Sellers ask \$25.50, but with prospects of lower freights they may come nearer to buyers' figures in course of a day or two.

Muck Bars.—Demand very slow, but without any change in prices. Sales at from \$26 @ \$27.50, delivered, the demand being chiefly for best qualities at \$27 @ \$27.50.

Blooms.—Prices are unchanged and quoted as follows: Soft Basic Blooms at from \$33.50 to \$35, Billets from \$38 to \$39, and Siemens-Martin at from \$40 to \$42. Domestic Blooms are quoted at from \$30.50 to \$32, delivered, for Nail Plate, and \$35 @ \$36 for Plate and Sheet Blooms. Other descriptions extremely dull, and prices nominal, as follows: Charcoal Blooms at \$50 @ \$52; Run-out Anthracite, \$43 @ \$44; Scrap Blooms, \$35 @ \$36; Northern Ore Blooms, \$35.

Bar Iron.—The demand for small lots keeps up pretty well, and the indications are that the mills will be able to run full time until midsummer. There is no general improvement, however, the demand being of a purely hand-to-mouth character. The suspension of work during midsummer, and the possibility of labor troubles in the West, is sufficient inducement to many to replenish their stocks so as to meet contingencies, but apart from that there is nothing more than the usual run of small orders. Prices are weak and irregular, varying all the way from 1.5¢ for Common Iron up to 1.8¢ for Best Refined, with concessions of more or less importance, according to quantity and specification of sizes.

Plate and Tank Iron.—Nothing doing except in small lots, at about same figures as last week. Large lots are not inquired for, and the outlook denotes a continuance of the present conditions for some time to come. Quotations about as follows: Ordinary Plate, 2¢; Tank, 2¢ @ 2.1¢; Shell, 2.5¢; Flange, 3.5¢; Fire-Box, 4.25¢; Steel Plates, Flange, 3.5¢ @ 3.75¢; Fire-Box, 4¢ @ 4.25¢.

Structural Iron.—There is nothing coming on the market but small orders, and it is found difficult to keep the mills running more than a half to two-thirds of their capacity. There are no large orders on hand of any account, so that manufacturers are almost entirely dependent on work coming in from day to day. Prices as before: 2¢ @ 2.1¢, delivered, for Angles, 2.1¢ @ 2.15¢ for Bridge Plate, 2.3¢ @ 2.4¢ for Tees, and 3¢ for Beams and Channels.

Sheet Iron.—The demand keeps up satisfactorily, and numerous inquiries are coming in, but there is no improvement in prices. Manufacturers are not disposed to enter

orders for forward delivery, however, unless at better figures than quoted for spot lots. The usual quotations are about as follows:

Best Refined, Nos. 26, 27 and 28..... 3 1/2¢
Best Refined, Nos. 18 to 25..... 3 1/4¢
Common, 1/4¢ less than the above.
Best Bloom Sheets, Nos. 26 to 28..... 5¢
Best Bloom Sheets, Nos. 22 to 25..... 4 1/2¢
Best Bloom Sheets, Nos. 16 to 21..... 4¢
Blue Annealed..... 2 1/2¢
Best Bloom, Galvanized, discount..... 60¢
Second quality, discount..... 60¢
Common, discount..... 65¢

Wrought-Iron Pipe.—The movement in the Pipe market has been fairly satisfactory during the week, but prices are unchanged. The feeling, however, is somewhat more hopeful, and, with a continuation of good weather and other favorable circumstances, it is anticipated that a slight advance in prices may be made, at least as far as the ordinary run of business is concerned. On large and desirable orders competition is very close, and it would appear that as regards this class of trade there is little anticipation of better prices. Prices for ordinary sized lots are generally quoted at about as follows, say: Butt-Welded Black Pipe, 45 @ 47 1/2%; Lap-Welded Black, 65 @ 67 1/2%; Butt-Welded Galvanized, 35 @ 37 1/2%; Lap-Welded Galvanized, 45 @ 47 1/2%; Boiler Tubes, 57 1/2 @ 60%.

Nails.—Notwithstanding the somewhat slow demand for Nails, the market is steady and prices show no change. The recent combination of manufacturers to stop production during two weeks will, it is anticipated, have the desired effect and keep prices from going lower. Iron Nails in an ordinary way are quoted at \$2.30 and Steel Nails at, say, \$2.40 @ \$2.45.

Steel Rails.—There is no special change to notice, although the feeling is firmer, but prices not notably higher. The accident to the Leawanna Company and possibility of a shut down by the Scranton throw more business in the way of other Eastern Mills, but the demand is mostly for small lots, so that there is no difficulty in placing all the orders that are required at about \$27.50. In some cases that quotation has been shaded, but the feeling is strengthening, and \$27.50 may now be considered an inside figure. Light Rails are in active demand, with sales at from \$29 to \$30 at mill for 30s and 35s.

Old Rails.—There is nothing doing of any account, and it is difficult to determine what the market price really is, buyers and sellers being from 50¢ to \$1 per ton apart in their ideas of value. Some holders ask very extreme prices, say \$17.75 to upward of \$18, Philadelphia, while buyers are indifferent at anything over \$17. An offer of \$17 was made for 2500 tons to arrive, but without finding any one to accept it. For deliveries in the interior \$18.50 @ \$19 is asked, with a few small lots taken at \$18.25 @ \$18.50.

Scrap Iron.—The demand is very slow, and prices are weak and a shade lower. We quote as follows: No. 1 Wrought Scrap, \$17.50 @ \$18; No. 2 do., \$12.50 @ \$13.50; Horse Shoes, \$22.50 @ \$23; Turnings, \$13.50 @ \$14; Old Car Wheels, \$15.50 @ \$16; Old Steel Rails, \$15.50 @ \$16; Fish Plates, \$22.50 @ \$23; Cast Scrap, \$13.50 @ \$14; do. Turnings, \$9.50 @ \$10.

Pittsburgh.

(By Telegraph to The Iron Age.)

PITTSBURGH, PA., May 13, 1885.

The scale demanded by the Western Iron manufacturers was this afternoon made public in advance of the conference tomorrow. It is quite radical in the changes proposed, demanding that the scale follow the price down, instead of stopping at 2 1/2 cents, as at present; that, while the agreement is for a year, it can be abrogated by 60 days' notice of either party; that the price for working mild steel, with the exception of sheets thinner than No. 20 gauge, be 10¢ less than for working iron; that the present scale on boiling be reduced 50 cents a ton, and on bar rolling 70 cents a ton, and decline with the decline in iron; muck rolling to be 10% of the price of boiling, instead of 12 1/2%, as at present. Most of the other scales are changed but little, though there have been quite a number of changes in the extras and the rules governing the working of the scales.

Office of The Iron Age, 77 Fourth Avenue, PITTSBURGH, PA., May 13, 1885.

So far as Pittsburgh is concerned there has been no important change in the business situation during the past week; in some departments of trade there is a fair degree of activity, but these are the exception. Our merchants and manufacturers generally report trade as being exceedingly dull and unsatisfactory, and, what is still worse, there is not much prospect of any immediate improvement. The conference committees of the Iron manufacturers and Amalgamated Association have not been able as yet to arrive at any satisfactory settlement of the wage scale. The Iron manufacturers had a meeting yesterday, and considerable time was taken up in considering the scale which is to be presented to the Amalgamated Association on Thursday of this week when there is to be another conference. What the result will be is very difficult at the present writing to surmise. Manufacturers are all agreed that there should be a sharp reduction on the present wage scale, while the leaders of the Amalgamated Association contend that, with natural gas, lower freight rates and cheaper Pig Iron, manufacturers are able to pay the present scale and meet competition. Many of our manufacturers say that unless they get a reduction in the cost of skilled labor they will have to close their mills, and that, in the present condition of affairs, some are barely able to hold their own while others are losing money.

Iron Ore.—Brokers who make a specialty of Ore report business as being exceedingly dull, with but little prospect of any immediate improvement. The few furnaces in blast are buying along as their immediate necessities require, and prices are weak, but without quotable change. Sale advices from Cleveland report little or no change in the situation there.

Pig Iron.—The depression continues, and no change for the better is expected as long as the wage scale remains unsettled. There is a strong probability of a shut-down on the 1st of the coming month, and with this in view consumers are buying just as little of the raw article, as they can possibly help. The outlook is anything but encouraging for the furnacemen, although there is sometimes a change for the better when least expected. Prices are down to, if not below, actual cost of production, yet there is scarcely any demand, as consumers claim that the market for the product is fully as bad if not worse than for the raw article. In regard to production it may not be out of place to state that a party here given to statistics claims that the output of the world during the year 1884 showed an increase of 7,000,000 tons, as compared with the preceding year. While stocks here are not excessive, they are largely in excess of present wants. It is estimated by those well informed that there are from 30,000 to 35,000 tons of the Marshall Iron still remaining unsold; some of this is owned by banks and insurance companies, and will be held for a better market, while other lots are in the hands of parties anxious to sell, and it is being offered wherever there is the least probability of effecting a sale. We quote regular prices as follows:

No. 1 Gray Forge..... \$15.25 @ \$15.50, 4 mos.
No. 2 Gray Forge..... 14.50 @ 14.75, 4 "
All-Over Mill..... 15.00 @ 15.50, 4 "
White and Mottled..... 13.50 @ 14.00, 4 "
No. 1 Foundry..... 17.00 @ 18.00, 4 "
No. 2 Foundry..... 15.50 @ 16.00, 4 "
Charcoal Warm Blast..... 20.00 @ 22.00, 4 "
Charcoal Cold Blast..... 25.00 @ 27.00, 4 "
Bessemer Iron..... 17.50 @ 18.00, 4 "

Muck Bar.—There appears to be no improvement in the demand, and, in the absence of sales, we quote nominally at \$26 @ \$26.50.

Manufactured Iron.—The demand for all kinds of Finished Iron continues very light, and prices are exceedingly unsatisfactory and irregular. It is intimated that some firms whose financial necessities are pressing and who are anxious for business are booking orders at prices which under most favorable circumstances afford little or no margin for profit. Steel continues to supplant Iron, and, if it continues as it has for the past year or two, Iron will be knocked out entirely within a few years. The latest encroachment of the latter on the former is in the matter of structural work, chains, &c.

Nails.—Manufacturers of Iron Nails continue to quote car lots and upward at \$2.05, 60 days, 2¢ off for cash, but they have been sold as low as \$2, 2¢ off for cash, and more are offered at the same rate. Steel Nails are still quoted 10¢ lb keg above the price of Iron, but it is said that a good many buyers refuse to make any difference in price. The report comes to us from Wheeling that \$2.15, 60 days, 2¢ off for cash in car lots, is the best that buyers can do there, but, from what we can learn, the demand has fallen off considerably as compared with what it was a month or six weeks ago. The regular monthly meeting of the Western Nail Association takes place at Columbus (Ohio) to-morrow; it is said that an effort will be made by some Western manufacturers (we mean those located west of here) to have the headquarters of the Association reinstated at Pittsburgh. It is intimated that some of the Wheeling men are now satisfied that they made a mistake in having the headquarters removed to Wheeling. So far as our Pittsburgh manufacturers are concerned it is a matter of little importance, but there is no doubt that the trade outside of Wheeling would much rather have their meetings in Pittsburgh.

Wrought-Iron Pipe.—Trade in this line is not picking up as fast as could be desired by any means, but it is hoped that there will be an improvement later on in the season. Prices continue unsatisfactory, and herein is the greatest cause of complaint. Discount on Black Butt-Welded Pipe, 1 1/4-inch and smaller sizes, 50¢; on Galvanized do., 40¢; on Black Lap-Welded Pipe, 1 1/2-inch and larger sizes, 60¢; Galvanized do., 50¢. Selected Pipe, or Pipe cut to specified lengths, discount 5¢ less than the rates above quoted. Discount on Boiler Tubes, 60¢. Two-inch Oil-well Tubing, 10¢ lb foot, net; 5 1/2-inch Oil-well Casing, 36¢ lb foot, net.

Steel.—Best brands of Refined Cast Steel remain unchanged at 8 1/4¢; Crucible Machinery, 4 1/4¢; Open-hearth and Bessemer do., 3¢. A contract for Crucible Steel for boilers was made during the week at 4 1/2¢. Steel Nail Slabs are still quoted at \$29 @ \$30 lb ton, delivered.

Steel Rails.—Heavy Sections are still quoted at \$27 lb ton, cash, at mill; small sales at \$28. The inquiry continues light, and as a rule buyers have their views considerably below sellers. It is claimed that there is no margin for profit below the prices quoted, and that, rather than cut under, makers had better close their mills or turn their attention to specialties.

Old Rails.—Old Iron Rails for near-by delivery remain unchanged at \$19.50, at which the last sales reported were made. Old Steel Rails still quotable at \$17 @ \$17.50.

Railway Track Supplies.—Railway Spikes remain unchanged at 1.9¢, delivered; Splice Bars, 1.65¢ @ 1.75¢; Track Bolts, 2.4¢ @ 2.5¢ with Square, and 2.65¢ @ 2.75¢ with Hexagon Nuts.

Crop Ends.—Steel Rail Ends continue scarce, with considerable inquiry, and prices are quoted steady at \$18.50 @ \$19; Steel Bloom Ends, \$17.75 @ \$18.25.

Scrap.—There is little doing; prices weaker, but unchanged. No. 1 Wrought Scrap, \$17 @ \$18 lb net ton; Wrought Turnings, \$13 @ \$15; Old Car Axles, \$24 @ \$25; Cast Borings, \$11 @ \$12, gross ton; Old Car Wheels, \$16 @ \$17, gross.

Window Glass.—Trade is reported rather better. Prices unchanged.

Chicago.

Office of The Iron Age, 36 and 38 Clark St., Cor. Lake St., CHICAGO, May 11, 1885.

Hardware.—The trade was a trifle less active during the past week. The cold weather which prevailed throughout the West had its effect on the prospect of the wheat crop, which discouraged buying goods for contemplated buildings in country districts, while plowing and seeding is diverting the farmer's attention from fencing and improving his property. But this does not denote a dull market; jobbers are well employed, and traveling salesmen continue to report light stocks in the hands of retailers. Prices are unchanged, as a rule, and tolerably steady. The manufacturer of Hunt's Axes has announced an advance of 50¢ a dozen on single Bits, and \$1 on double Bits, which restores them to their former position in the West—50¢ lb dozen above other makes. First qualities of Steel goods are increasing in demand as compared with that for second, there being very little difference in price. Complaints are still heard from dealers of their inability to have orders for Flat-Head Screws filled at 90¢ discount. These murmurings have increased since the advance in price by some of the manufacturers, but no serious inconvenience has thus far been reported. The market in other respects has a promising outlook, and with settled, warm spring weather the demand is expected to largely increase over what it was during the month of April.

Barb Wire.—A material decline in the demand is noticed as the season advances, the transactions being mostly in lots of 1 to 3 tons. Some of the mills in Joliet and vicinity have shut down, others are running part of their force, and, from general appearance, the bulk of the spring trade has been supplied. The cessation in demand has weakened prices. We hear of manufacturers offering carload lots of Licensed Four-Pointed Painted Wire at 3.4¢, and Unlicensed at 3.25¢ @ 3.3¢. Two-Point Wire is held 1/4¢ above these prices. The regular quotation by jobbers from this city for Painted Four-Point Cattle Wire is 3 3/4¢; Four-Point Hog Wire and Two-Point Cattle Wire, 3 1/4¢; Two-Point Hog Wire, 3 1/2¢; Galvanized, 1¢ additional. Carload lots of Four-Point Painted are said to have been offered in the country at 3.6¢ and by others at 3 3/4¢, delivered. The desire of manufacturers to dispose of stocks which they have in hand is the only reason assigned for the reductions that have been made within the last two weeks, and the precautions they are taking in thus stopping their mills before stocks have accumulated to any extent will greatly assist in keeping the price steady at about these figures.

Nails.—The Nail market, which has been in a rather demoralized condition for the past three weeks, has not improved any. Manufacturers persist in making Chicago the dumping ground for accumulated stocks, and when they come here to unload they shop from place to place to obtain the best offer they can get and conclude the sale. Under these transactions the market has completely broken, and Iron Nails may now be quoted at \$2.15 in small lots from store. Some of the jobbers are contending that this is their price for carload lots also, but there are rumors that carload lots have been sold at \$2.10, 2¢, 60 days. Considering the decline in price the demand continues very fair. Some of the dealers are reporting that they have sold more Nails during the past week than for several weeks previous. Steel Nails are quoted at \$2.25 in any quantity. There is probably less demand for carload lots of Steel Nails at the moment than some time ago, but the scarcity of the Nail in the market would make it almost impossible to fill car orders. There are some sizes which could be supplied, but usually those are the ones which are the least desirable. The demand in small lots continues strong, and many new dealers are constantly coming into the market for trial lots.

American Pig Iron.—There is little or no change to note in the condition of this market from that of a week ago. The demand is fairly active in carload lots, with perhaps a trifle greater inquiry for larger quantities. Foundries and large consumers are taking a little more stock comparatively than during the month of April, but the desire to anticipate wants is not important. While it is conceded that the market is in the buyer's favor, there have been fewer concessions made than during the week previous; this may be in part because there were no large orders brought out, and, second, because makers of good brands of Pig Iron are heartily sick of selling Iron at the present price. It is said that there are several Lake Superior charcoal furnaces, which have not been out of blast for years, which will blow out between this and the 1st of July. Manufacturers claim that they see no other remedy for the low price than to stop the making of Iron, and give consumption an opportunity to seek the Iron, rather than make the Iron seek the consumer. We make the following quotations for carload lots, 4 months: Lake Superior Charcoal Nos. 1, 2 and 3, \$19.50 @ \$20; 4, 5 and 6, \$21 @ \$22; Lake Superior Coke, all Ore, \$19; Cinder Mixed, \$17 @ \$18; Ohio Standard Black Band, \$18.50 @ \$19; Southern No. 2, \$17; No. 3, \$15; Mill Iron, \$14.50 @ \$15. The price on Southern No. 2 is regarded as being too high compared with other Irons, but makers, being able to find

Trade Report.

General Hardware.

There are few changes in price to note. The volume of business shows no material modification, the spring weather, however, stimulating retail trade through the country and calling out many assorted orders. Manufacturers are not as eager as sometimes to sell goods, the margins of profit being in many cases very narrow. The general financial condition remains fairly satisfactory, though from some sections we hear of slow collections in this city.

We regret to have to announce to the trade the death of

OSCAR A. SPENCER,

at his residence in Brooklyn, on Monday, 11th inst., at the age of 57. Mr. Spencer was formerly of the firm of Spencer & Underhill, of this city, and was a special partner at the time of his death in their successors, Underhill, Clinch & Co. When a young man he came to this city from the interior of the State and entered the Hardware House of Bliven & Mead, where he was an able and efficient stockman and popular salesman, rising ultimately to a partnership in the house. He is referred to as both energetic and conservative in his business life and of strictest integrity, while pleasant tributes are paid to him personally as genial, affectionate and generous. We understand that by special agreement his interest in Underhill, Clinch & Co. remains without change until the expiration of the present copartnership.

BARB WIRE.

The market shows occasional signs of weakness. Some of the mills are fairly busy; others are eager for business. We quote carload lots, Four-Point Galvanized Barb Wire, 4.65¢ @ 4.75¢ and small lots, 4.9¢ @ 5¢. The scope of the decision at Des Moines in favor of Washburn & Moen Mfg. Co. on the Glidden patent cannot be estimated from the telegraphic reports thus far received.

SCREWS.

The following are the quotations on Wood Screws of the Union Steel Screw Company, Cleveland, Ohio, who are represented in this city by A. Field & Son, as they are given in the circular to which we referred last week:

Flat Head, Steel.....	discount 85 and 5¢
Flat Head, Brass.....	discount 85¢
Round Head, Steel.....	discount 83¼¢
Round Head, Brass.....	discount 89¼¢

The above discounts apply, it will be understood, to their list of April 1.

Under date May 8, the United States Screw Company, Meriden, Conn., and 95 Chambers street, announce the following discounts:

Flat Head, Iron.....	85¢
Round Head, Iron.....	83¼¢
Flat Head, Brass.....	85¢
Round Head, Brass.....	89¼¢
Flat Head, blued, add 9¼¢ to net amount of invoice.....	85¢
Round Head, blued.....	89¼¢

None of the other companies make further public announcements as to revision of prices, but it is intimated that the Atlantic Screw Works are not accepting orders at the extreme low prices, and that P. & F. Corbin are only to a limited extent selling Screws at the prices they have named. The Russell & Erwin Manufacturing Company are still in the market on the terms of their circular, but, while selling their production, which has been increased to meet the demand, are not enabled to fill nearly all the orders that come to them. The American Screw Company and the companies who have advanced their quotations report that they are selling more Screws than a week or two ago, and speak of the market as stiffening in spite of the adverse influence of the low quotations that are still prevailing.

BRASS BUTTS.

The manufacturers of Brass Butts have taken action for the establishment of better prices, and announce as the discount on this line 70 per cent., which will be recognized by the trade at large as a very material advance on former quotations. The necessity for better prices has been recognized, as these goods have been selling at exceptionally low figures for some time. The impression prevails that these goods will be held at these prices, and it is intimated that few back orders have been booked at previous figures, the trade very wisely having kept in ignorance of the proposed action. The following manufacturers unite in the discount referred to above:

F. & F. Corbin,
The Russell & Erwin Mfg. Co.
Benedict & Burnham Mfg. Co.
Bridgeport Brass Company,
Plume & Atwood Mfg. Co.

NAILS.

The market has been irregular. There was a flurry lasting a few days, due to sales at lower figures to recover trade endangered by competitors, and for the time being Nails were freely sold at \$2.10 for small lots. Since then these prices have been withdrawn. Options have been extended in some cases on large lots of Nails on dock at \$2 @ \$2.05. Store prices are nominally \$2.20 for round lots of Iron Nails, with an advance of 10¢ on Steel Nails. The condition of the Nail market in Philadelphia, Pittsburgh, Chicago and other points is reported elsewhere. The two manufacturers of the Pennsylvania and New Jersey Nail Conference who had not agreed to its de-

cision at the last meeting have since joined in the movement of two weeks' suspension. All the New England mills have entered into the same arrangement. A meeting of the Atlantic States Nail Association is to be held in this city on the 14th.

At the request of a number of correspondents we reprint below the variations in the price of wholesale lots of Nails from New-York store, published in our issues of December 25, 1884, and January 1, 1885. The list covers a period of 15 years:

1870.	January 6.....	4.75	February 21.....	2.50
	March 10.....	4.60	April 24.....	2.30
	March 24.....	4.50	July 25.....	2.25
	April 28.....	4.35	September 5.....	2.20
	June 9.....	4.25	September 26.....	2.15
	September 8.....	4.50	November 21.....	2.10
	December 29.....	4.37½		
1871.	March 9.....	\$4.40	March 27.....	\$2.15
	May 4.....	4.05	April 24.....	2.35
	July 6.....	4.25	July 25.....	2.15
	September 14.....	4.50	August 31.....	2.35
	November 2.....	4.65	September 11.....	2.05
			September 18.....	2.00
1872.	January 18.....	\$4.75	October 21.....	2.30
	February 22.....	5.00	October 9.....	3.60
	March 14.....	5.25		
	April 4.....	5.75	1880.	
	August 22.....	5.80	January 1.....	\$4.25
	September 12.....	5.85	January 15.....	4.75
	December 19.....	5.50	January 22.....	5.15
			February 2.....	5.00
1873.	January 2.....	\$5.00	April 22.....	5.00
	January 16.....	4.80	April 29.....	4.50
	January 30.....	4.70	May 6.....	4.15
	February 13.....	4.80	May 20.....	3.00
	February 27.....	4.80	June 24.....	2.75
	March 13.....	5.05	July 29.....	3.00
	March 27.....	5.05	September 2.....	3.15
	April 10.....	4.85	October 16.....	2.90
	May 15.....	4.75	November 11.....	2.75
	June 19.....	4.50		
	December 4.....	4.35	1881.	
1874.	January 8.....	\$4.00	January 6.....	\$2.90
	April 30.....	3.90	March 3.....	3.00
	June 4.....	3.85	April 21.....	3.05
	June 25.....	3.80	July 7.....	2.95
	July 9.....	3.75	August 18.....	2.90
	August 30.....	3.70	September 22.....	3.05
	September 21.....	3.60		
	October 23.....	3.60	1882.	
	November 19.....	3.50	January 19.....	\$3.40
	December 24.....	3.40	March 30.....	3.30
			May 18.....	3.25
1875.	February 18.....	\$3.35	June 8.....	3.25
	March 18.....	3.35	August 17.....	3.55
	August 19.....	3.15	September 7.....	3.65
	September 2.....	3.15	October 14.....	3.75
	September 16.....	3.10	October 19.....	3.65
	October 28.....	3.00	December 14.....	3.65
			December 19.....	3.65
1876.	January 13.....	\$2.90	1883.	
	March 2.....	2.85	January 4.....	\$3.40
	March 9.....	2.80	February 15.....	3.35
	March 29.....	2.75	March 15.....	3.15
	May 18.....	2.85	April 26.....	3.00
	June 1.....	3.00	October 8.....	2.85
	November 23.....	2.90	November 8.....	2.75
			November 23.....	2.75
1877.	February 21.....	2.75	December 13.....	2.60
	March 29.....	2.65	December 37.....	2.60
	April 19.....	2.60		
	April 26.....	2.50	1884.	
	June 7.....	2.40	January 31.....	\$3.50
	December 27.....	2.40	May 29.....	3.40
			June 12.....	3.40
1878.	January 3.....	\$2.30	June 26.....	2.85
	January 24.....	2.40	July 17.....	2.80
			August 7.....	2.35
			September 4.....	2.30
			September 11.....	2.15
			September 18.....	2.10
			October 16.....	2.05
			November 13.....	2.00

MISCELLANEOUS PRICES.

The Douglas Axe Manufacturing Company, Boston, Mass., and Wm. Mann, Jr., & Co., Lewistown, Pa., for whom Edward A. Bolmes, 97 Chambers street, is agent, have issued circulars announcing an advance of 50 cents per dozen for Single Bit and \$1 per dozen for Double Bit Axes. Similar announcements will probably be made before long by other manufacturers.

Hemp and Flax Twine are still very firm, with a tendency to advance, the cause being the great shortage in the crop. Manila and Sisal are also firm at present prices, and Manila Rope especially is regarded as liable to advance.

On another page we give the list of Steam and Gas Fitters' Brass and Iron Work, which has been agreed upon by manufacturers generally and will undoubtedly be the standard list.

The list price of Zimmermann's Blind Fast and Bower, which is sold by Sise, Gibson & Co., 100 Chambers street, New York, has been advanced to the following figures and is subject to a discount of 10 per cent.:

Japanned.			Per doz. Gross.		
* Length of Bar 9 in., diameter 5-16.....	2.75	\$30.00	* Length of Bar 9 in., diameter 5-16.....	2.75	\$30.00
* Length of Bar 10¼ in., diameter 5-16.....	2.75	33.00	* Length of Bar 10¼ in., diameter 5-16.....	2.75	33.00
* Length of Bar 12 in., diameter 5-16.....	3.00	36.00	* Length of Bar 12 in., diameter 5-16.....	3.00	36.00
* Length of Bar 14 in., diameter ¾.....	3.50	42.00	* Length of Bar 14 in., diameter ¾.....	3.50	42.00
* Length of Bar 16 in., diameter ¾.....	3.85	46.00	* Length of Bar 16 in., diameter ¾.....	3.85	46.00
* Length of Bar 18 in., diameter ¾.....	4.20	50.00	* Length of Bar 18 in., diameter ¾.....	4.20	50.00
Galvanized.			Per doz. Gross.		
* Length of Bar 9 in., diameter 5-16.....	2.75	\$30.00	* Length of Bar 9 in., diameter 5-16.....	2.75	\$30.00
* Length of Bar 10¼ in., diameter 5-16.....	2.75	33.00	* Length of Bar 10¼ in., diameter 5-16.....	2.75	33.00
* Length of Bar 12 in., diameter 5-16.....	3.00	36.00	* Length of Bar 12 in., diameter 5-16.....	3.00	36.00
* Length of Bar 14 in., diameter ¾.....	3.50	42.00	* Length of Bar 14 in., diameter ¾.....	3.50	42.00
* Length of Bar 16 in., diameter ¾.....	3.85	46.00	* Length of Bar 16 in., diameter ¾.....	3.85	46.00
* Length of Bar 18 in., diameter ¾.....	4.20	50.00	* Length of Bar 18 in., diameter ¾.....	4.20	50.00

* Only for Frame Houses. * For Brick or Frame Houses. All goods packed with Screws.

The circular describing this article refers to and illustrates its special features and shows the manner in which it holds Blinds or Shutters firmly at any angle desired. They are made, it will be seen, of several sizes to suit windows with deep or shallow recesses, where long or narrow Butts are used. The convenience of the Brace Bar which serves as a handle to the Blind is also alluded to as enabling ladies and children to open the bow and close the blinds with ease without reaching beyond the subail.

The Scheidler Post Hole Digger, which is manufactured by Myers, Housel & Co., Canton, Ohio, and illustrated in the advertisement on page 44 is sold at \$24 per dozen, 60 days, subject to a discount of 2 per cent. for cash in 15 days.

The illustrated and descriptive catalogue of the Door Locks, Knobs, Escutcheons, &c., manufactured by the Perkins Specialty Lock Company, Cleveland, Ohio, exhibits the goods which they are making, including their recent additions. In their introductory circular the manufacturers refer to the advantages possessed by their Locks, giving, they claim, better security than others in the market. When locked from the inside and the thumb knob turned, their locks are de-

scribed as absolutely burglar-proof, as by this operation the thumb bolt is thrown, and latch and knob securely locked, while at the same time the key-hole is firmly closed by a solid piece of steel against the introduction of any key or implement by which the locking bolt might be tampered with. Their list, in which full information is given concerning the principle on which the locks are made and their construction illustrated, is subject to a discount of 60 and 25 per cent.

The Penfield Block Company, Lockport, N. Y., for whom the Henry B. Newhall Company, are agents, 105 Chambers street, New York, have made a change in the discount of their West Patent Key Lock Faucet, which is now 50 instead of 45 per cent. discount as heretofore. They also inform us that in future all orders for Faucets will be packed in bulk, in barrels or boxes, without extra charge. If, however, they are ordered to be packed in boxes of one dozen each, a net charge for each gross of Faucets will be made for boxes at the rate of 60 cents per gross for No. 1, 72 cents per gross for No. 2 and 84 cents per gross for No. 3. Orders can be filled direct from the factory or from the New York house, as desired.

Walbridge & Co., Buffalo, N. Y., manufacturers of Iron Reservoir Vases, quote their Vases and Settees at discount 30 per cent., and at the same time quote Glove Lawn Sprinklers at discount 30; 10; Lawn Sprinklers Nos. 10 and 50 at discount 40 and 10, and Prize Hose Reels at discount 50 and 10. Their line of Reservoir Vases is fully illustrated in their catalogue, which gives dimensions and list prices. They refer to their increasing sale as evidence that the Reservoir principle has real merit and is appreciated by the public. A number of new designs have been recently added. The Vases are painted with two coats of white paint, unless otherwise ordered. At the discount named, the manufacturers express the opinion that the net cost of the Reservoir Vases will be found to compare favorably with the prices of ordinary Vases of similar sizes and styles.

ROLLER SKATES.

The "Derby" Roller Skate, manufactured by Sise, Gibson & Co., Birmingham, Conn., and 100 Chambers street, New York, is sold from the following list, which is subject to a discount of 25 and 5 per cent.:

	Per pair
No. 30, All Clamp, Blued.....	\$4.00
No. 30, all Clamp, Nickel.....	7.00
No. 25, all Clamp and Heel Thumb Screw, Blued.....	4.50
No. 25, all Clamp and Heel Thumb Screw, Nickel.....	7.50
Heel Thumb Screw works both Toe and Heel Clamps, saving use of Key.....	
No. 30, Half Clamp and extra Leather Heel Strap, Blued.....	\$4.00
No. 30, Half Clamp and extra Leather Heel Strap, Nickel.....	7.00
No. 35, Half Clamp, Leather Heel Strap and Thumb Screw, Blued.....	4.50
No. 35, Half Clamp, Leather Heel Strap and Thumb Screw, Nickel.....	7.50
Heel Thumb Screw works Toe Clamp, saving use of Key.....	

The manufacturers allude to the simplicity and strength of this Skate, which was shown in their advertisement on page 47 of last week's *Iron Age*, as its prominent features. The clamps are under the ball of the foot, and the cushions referred to as so placed as to give the longest possible wearing power. Attention is also called to the fact that the construction of the working parts is such that a 2½-inch wheel can be easily worn, and on Skates Nos. 25 and 35 even 2½-inch can be used for racing.

Samuel A. Haines, 88 Chambers street, New York, has been appointed the sole sales agent for the United States of the "Perfection" Roller Skate, manufactured by the Machine and Steel Pulley Company, Indianapolis, Ind. This Skate is commended by the manufacturers on account of its lightness, strength and fine movement. Its tension for adjusting the Skate for plain or scientific skating, and the fact that it has a direct-acting double cushion, which is described as especially durable, are referred to as special features. It is also furnished with their Patent Self Lubricator, a contrivance by means of which the wheels are oiled as required, a candle or lubricator being inserted in the wheel and pressed upon the axle as required by a screw which is operated from the surface of the wheel. The Skate is sold from the following list, which is subject to a discount of 33½ per cent.:

	Per pair
Rink Skate, Wood Bottom.....	\$3.00
Refined Malleable-Iron Bottom Rink Skate, Black Finish.....	3.00
Rink Club, Half Clamp, Metal Bottom, Fully Nickel.....	4.00
Nickel-plated Club "C," Nickel-plated Half Clamp.....	6.00
Steel Bottom, Half Clamp, "Perfection S," Hangers, Riveted with Brass Rivets.....	6.00

ITEMS.

The Pittsfield Tack Company, Pittsfield, Mass., announce to the trade that they have employed Samuel A. Haines as their sales agent, 88 Chambers street, New York, and that he is authorized to take orders for goods of their production for shipment direct from factory at their most favorable prices and terms. An announcement with reference to this arrangement will be found on page 12.

Owley Brothers & Marble, Chicago, manufacturers of the Acme Wrenches, have appointed Chas. X. Cordier, 101 Chambers street, their agent, where for the convenience of the trade he will carry a stock of the goods. The points made in favor of the Acme Wrench are the following: That it is made of only four pieces of steel where other Wrenches are composed of from seven to nine pieces; that it has no handle to get loose or clog with oil;

that having two slides makes it very much stronger; that the thread in the nut is about twice as long as in the ordinary wrench, and that consequently there cannot be the usual amount of play in the slides; that the jaws open one-eighth wider than other wrenches of corresponding size, and as a point of special importance they remind the trade that the wrenches are made entirely of steel and the jaws hardened, rendering them exceptionally durable. These parties are making the "Standard" Wrench, both nicked and bright, attention being directed to the fact that their list is the same for Bright Wrenches that others charge for Black, and that their Nicked Wrench is but a trifle higher than the list of other makers' Bright Wrenches. They are offered to the trade generally at about the same discounts as Coes' Wrenches. They also make a 4½-inch Pocket or Bicycle Wrench, which is furnished nicked or polished.

The Toledo Block Works, M. Donovan, proprietor, Toledo, Ohio, manufacturers of Wood and Wrought-Iron Pulley Blocks, &c., have this year enlarged their factory to nearly twice its former size, and are putting in machinery from which they intend to manufacture School Furniture of a style which they speak of as entirely new, and to the merits of which they direct special attention.

G. & H. Barnett, Black Diamond File Works, Philadelphia, Pa., in an attractive circular, intended specially for their export trade, call attention to their facilities for manufacturing Files, and allude to the success they have achieved in the Dominion of Canada, where they refer to their goods as meeting with favor in competition with Sheffield Files.

The Kansas City Commercial, in a recent issue, contains a sketch of the Richards & Conover Hardware Company, Kansas City, Mo., giving the history of the concern and describing the character and extent of their present business. We note that the paper also contains a line of quotations on Hardware, which are furnished by them.

M. D. Jones & Co., 76 Washington street, Boston, manufacturers of the "Hub" Lawn Sprinkler, to which we referred last week, issue a circular devoted to their line of Sprinklers, which shows the different styles of which they are manufacturers. Among these, besides the "Hub," are the "Globe," the "Gem" and "Jones Improved Lawn Sprinklers." The latter is made with 4, 6 or 8 arms, as desired, and also supplied with Ball and Basket Jet.

William Schollhorn & Co., New Haven, Conn., in their recent catalogue describe their line of Ladies' Scissors, Shears, &c., and Coach Hardware specialties. In the Scissors line they are making the German and English styles, to the finish of which they direct attention, as well as to their durability and cutting qualities.

Announcement is made that Arnold & Rowe, Lansingburg, N. Y., have transferred their entire business to the Rensselaer Mfg. Co., who in turn announce that practically there will be no change in the management of the business, and that it will be their aim to serve old and new customers promptly and satisfactorily. Of this company Samuel V. Arnold is president, and Ellis L. Rowe, secretary and treasurer.

Wachs Brothers & Co., Covington, Ky., offer the trade their Improved Roaster and Baker. They announce that owing to their increased facilities for manufacturing this article, they are enabled to make a very material reduction in its price, so that it can be sold at a moderate advance on the price of common pans. Of this article the following sizes are made, which are designed to retail at the figures named:

	Length.	Width.	Height.	Retail Price.
Small family size.....	15	8	3½	.60
Medium.....	15	10	6¼	.80
Large.....	16½	12	8	1.00
Extra large.....	18	12½	8	1.30

They direct special attention to the merits of this article for roasting meats, fowls, and for baking bread, pastry, &c.

The Humason & Beckley Mfg. Co., manufacturers of Hardware and Pocket Cutlery, have removed to No. 80 Chambers street, where, as heretofore at 294 Broadway, they will carry a stock of their goods. At the same place V. P. Humason, treasurer and agent of the company, will represent Stephens & Co., manufacturers of Rules, the William Rogers Mfg. Co., manufacturers of Silver-plated Ware, and the Brattleboro Tool Company, manufacturers of Steer's Patent Iron Planes and Expansive Bits.

Announcement is made that the incorporated company known as the Russell Wrench and Novelty Mfg. Co., Sterling, Ohio, have for convenience had their name changed to the Sterling Wrench Company. They announce that they are fitted up with approved machinery for the manufacture of the Campfield Patent Screw Wrench, which they will be able to supply in large quantities and at materially reduced prices.

Griffin's Butcher Saw No. 45, which is sold by C. E. Jennings & Co., Chambers street, New York, is made with Galvanized-Iron Frame and Patent Handles, the principle used in Griffin's Hack Saw being employed in it. The blade is secured in place by two pins, and may be readily detached, and the tension is regulated by the lever in the open handle. It is packed in paper packages of one frame, with three extra blades, and in cases containing five dozen.

Our readers will observe on page 37 the advertisement of James Eijl, Providence, R. I., manufacturer of Galvanized Sheet Iron

Ware, Factory Cans, Ash Cans, Galvanized Buckets, &c., in which he directs special attention to the goods illustrated.

The Duplex Swing which the F. F. Adams Company, Erie, Pa., have recently put on the market is represented in their advertisement on page 32, where its construction is explained and information given concerning the sizes which they are making.

H. D. Edwards & Co., 16, 18 and 20 Woodward avenue, Detroit, Mich., issue a circular describing Smith's patent Belt Fastener, which they manufacture. The Fastener consists of a staple with a broad, flat head, the prongs of which are riveted to a strap or washer on the other side of the belt. It is claimed by the manufacturers that these Fasteners, besides being economical and easy of application, will run successfully where a tightener is used on the belt.

Sutton Bros. & Bell, Indiana, Pa., among their other lines, are making Garden Vases, to the designs of which, and especially to the low figures at which they are sold, they direct the attention of the trade. In addition to those which are represented in their circular, they have just added, they advise us, a new and handsome pattern, which they refer to as an exceptionally desirable vase for the money.

The Hercules Powder Company, 40 Prospect street, Cleveland, Ohio, have issued a neat little pamphlet descriptive of "Hercules" Powder which they manufacture. In it they mention the fact that during the past seven years they have manufactured and sold over 10,000,000 pounds of powder, and the only accidents that have occurred in its handling or use have been two in mines. They claim that a careful system of experiments carried on for several years has enabled them to produce a powder embodying in the highest possible degree the two elements of efficiency and safety. The pamphlet deals at considerable length with the properties of "Hercules" powder and the best methods of using it. Illustrations and descriptions are given showing the methods of removing stumps and boulders by the use of this Powder. Batteries and Blasting Reels for igniting charges of Powder from a distance are referred to, with cuts illustrating their construction. The pamphlet closes with a short description of the composition of "Hercules" Powder and the conditions under which it will explode.

The Reading Hardware Company, Reading, Pa., are directing attention to the "Chantrell" brace, which is made in two forms, with and without ratchet. They claim for it that several essential requirements have been happily combined in its design and construction. It is declared that the bit or drill is held absolutely fast under all circumstances, and that it will hold a twist drill as rigidly as a specially constructed drill chuck. The tool is grasped at both top and bottom, so that it is impossible for it to twist or move in any direction. The construction is such that there is no friction, and consequently there is no wear on the parts. The fewest possible parts are employed, and each part is of the best material. The ratchet consists of direct-acting dogs placed at the end of the chuck. No metal is cut away, but the full strength of the parts is preserved. The ratchet can be shifted with either thumb or finger, and without removing the hand from the revolving handle. The design is handsome. The parts have a rounded outline and are nicely finished. The revolving handle is of rosewood, and the head of lignumvite. The metal parts are nickel-plated.

WHAT THE TRADE SAY.

Concerning

and the sympathy in the constant lowering of prices seems to be with the manufacturer. This sympathy comes from outside sources, from people who know, while not in the business, that the shrinkages are not legitimate, and, if from them, how much more from those who are in the ring, who are in the business and who know only too well that the manufacturer is the great, if not the only, sufferer. We are not running a sympathy factory in the interests of manufacturers, but we do believe they are the abused class of to-day. Their abuse may be of their own bringing on in a manner, and is partly of their own keeping up, yet the cutting and slashing that are done in nearly all lines of manufactured goods is to be fathered on the jobber. Six months ago we were making the same complaint we make now—we don't know what we are doing and we are no longer buyers of goods, but "snap finders" and brothers in infamy in the skin game of knocking the bottom out of everything made.

CATALOGUES.

Manning, Bowman & Co., Meriden, Conn., and 57 Beekman street, New York, in their catalogue which has just been issued, make a full and attractive exhibit of their "Perfection" Granite Iron Ware, Decorated Pearl Agate Ware, Porcelain Coffee Urns, Water Coolers, &c. The volume is fully illustrated, giving cuts of the different articles, many of which are colored so as to represent as nearly as may be the appearance of the goods. In their remarks they refer to the fact that in the manufacture of Britannia and Platinized Ware competition has for some time been directed toward depressing prices and deteriorating the quality of goods, but they say that into such a contest they have refused to enter, and refer to the quality of their goods as being fully maintained. Their specialty of White Nickel-Plated Ware they now produce under the new process, to the merits of which they allude. Their "Perfection" Granite Iron Ware they describe as a combination of an insoluble vitreous coating fused into and upon all surfaces of the fire-proof metallic forms, producing a line of Table Ware in finely mottled gray porcelain, to which they attach the white-metal mountings. They refer to it, therefore, as combining the durability of metal with the purity of china. Their Decorated Pearl Agate Ware is of the same general nature as the Granite, the difference being that repeated coatings give to it a fine porcelain surface which may then be decorated with artistic designs of flowers, fruits, landscapes, &c. The list is large, well-printed and attractive, and will be of interest to the trade. In it, it will be seen, they have made many radical changes in list prices on many of their goods, for the purpose of placing them on a uniform basis of 25 per cent. discount. The only exceptions to which they allude are Call Bells, Cigar Lighters and Polished Tin Pots, page 115, which are subject to discount of 40 per cent., all the other goods being subject to the discount of 25 per cent. Goods f.o.b. in New York or shipped from Meriden at same rates. Time, four months, or a discount for cash in 30 days of 5 per cent.

The price list of S. C. & G. H. Smith, Lowell, Mass., is a neat and attractive exhibit of the line of Cap, Set and Finished Screws of which they are manufacturers. In their introductory remarks the attention of the trade is directed to the quality of the goods which are thus offered. The line covered is as follows: Case-Hardened Iron Set Screws, square and slotted heads; Square Head Cap Screws, Unfinished Hexagon Head Cap Screws, Round Slotted Head Machine Screws, Studs for Engines, Steam Pumps, &c., Forged Coupling Bolts and Nuts, Forged Black Square Cap Screws, Forged Black Hexagon Head Cap Screws, Machinists' Hand Taps, and Cutter Head and Cylinder Bolts. Concerning these different lines descriptions are given of their special features, and other information which will be of use to the trade.

The catalogue of the Lufkin Rule Company, Cleveland, Ohio, describes the Board and Log Rules, Log Calipers, Boot Calks, &c., of which they are manufacturers. In their introductory remarks they allude to having added extensively to the plant, claiming to be the largest producers of Forged Boot Calks in the West. They allude also to the special points which they make in favor of their Board and Log Rules, which are described as riven from clear second-growth hickory butts and shaped by hand. The figures are burnt on the wood, insuring legibility. The heads are of steel, firmly braced to brass shoulders or made solid, as any other patent socket heads.

The Walker Horsehoe Company issue a small pamphlet devoted to the description of their Patent Forged Horse and Mule Shoes, calling special attention to the points on which they lay emphasis, and giving recommendations from many parties who have used them.

Mallory, Wheeler & Co., issue a number of extra pages containing revised list prices and illustrations and lists of goods recently added to their line.

Hibbard, Spencer, Bartlett & Co., Chicago, issue a price current dated May 4, in which, besides Tin Plate and Metals, they illustrate such reasonable lines as Steel Goods, Lawn Mowers, Refrigerators, Water Coolers, Freezers, Dairy Goods, Spring Hinges, Screen Door Frames, &c.

A feature of the catalogue of the Pawtucket Mfg. Co., Pawtucket, R. I., which was not mentioned in our review of it in last issue of *The Iron Age*, is the illustration, near the end, of the large variety of Bolts which they are prepared to furnish, with

cuts, which are interesting as exhibiting the different kinds of Bolts referred to. The suggestion is made that if their customers wish to order Bolts not thus illustrated, they can refer to some number which comes nearest to what they want and make that the basis of this description.

HARDWARE PRICE BOOK.

T. W. Root, Detroit, Mich., calls the attention of the trade to his Hardware Price Book, illustrated and interleaved, for Hardware buyers, salesmen and entry clerks, reminding the trade that it is furnished either singly or doubly interleaved in the different styles of binding described, and that it covers the leading goods sold by the Hardware trade, the selections and cuts being from nearly 400 factories. The prices are given below, each volume having 239 printed and illustrated pages, the books differing only in single or double interleaving and binding; 100 extra unbound pages (instead of 84, as heretofore) being sent with each copy. The arrangement of these extra pages has also been revised, so that both sides of a leaf will be likely to be wanted when either side is required, and by paging them from 8A to 216B appropriately for insertion with other similar lines in bound Price Book. Prices and style are as follows:

No. 1, 478 pages, every other leaf extra heavy writing paper, with red-ink headlines and down rulings, which gives one fine ruled page for noting prices, in pencil, facing printed page. Four short stubs are placed after each 16 pages to give room for inserting other leaves showing new goods. Strongly and nicely bound, with dark-colored genuine morocco-leather flexible cover and flaps, with pocket inside the cover. Price, \$7.00 per copy.

No. 2, like No. 1, but red Russia leather. Price \$7.00 per copy.

No. 3, like No. 1, but doubly interleaved, contains 717 pages, 478 of which are extra heavy interleaving paper, with red-ink headlines and down rulings, which gives two interleaved pages for noting prices instead of one. The sale of No. 3 now said to about equal all the other numbers. Price \$8.00 per copy.

No. 4, like No. 1, but without flap or pocket. Price \$6.00 per copy.

No. 4½, like No. 3, but without flap or pocket. Price \$7.00 per copy.

No. 5, like No. 4, but red imitation Russia leather. Price \$6.00 per copy.

Old No. 2, with lighter interleaving and without down ruling. A few copies are in stock, which will be closed out, including the extra pages, at price, \$5.00 per copy.

THE EBERHARD MFG. CO.,

Cleveland, Ohio, have issued a catalogue which covers a complete line of their common Sadlery Hardware, to the arrangement of which special attention is directed as possessing novel features which are introduced for the convenience of the trade. Care has been exercised that the several lines appear together unbroken, and in most convenient order of succession. A rearrangement has been made in the numbering of the goods, resulting in the avoidance of duplicate numbers. This involved changes in numbers from previous issues, but does not affect the result to the extent of changing what may be termed trade or very familiar numbers, such as 50, Roller Buckles; 47, Bits; 215, Terrets, &c. It is stated that all the "catch" numbers are retained, and a repetition of sound in numbers is had by duplicating the numbers in part, producing a similarity or euphony in sound, designed to assist the customer to unconsciously memorize an additional quantity of numbers and enable him to recognize a particular class of goods by the number. A Bridle number always ends with the one sound; a Harness Buckle always with a two sound; a Trace Buckle with a three sound, and in the numbering of Buckles the use of three figures indicates that the Buckle has a center bar, Buckles without a center bar having but two figures in numbering. The system of lettering sizes, whenever possible, has also been adopted, a given letter always designating a particular size. The correspondence of letters with sizes is as follows: A, ½; B, ¾; C, ¾; D, ¾; E, 1; H, 1½; M, 1¾, &c. The letters for the more common sizes of articles will, it is remarked, become familiar, together with the numbers. As there are no duplicate numbers, attention is directed to the fact that the use of numbers for the articles, and of letters for the sizes, in ordering goods renders any explanation further than descriptions of the lines unnecessary.

The lists of the following patented specialties, it will be seen, are changed: Novelty Harness Loops and Perfect Hame Trac Carriers, Halter Loops, Ring, Acme Trace Carriers and Hollow Iron Hames. The lists on Hollow Iron Hames have been rearranged, and they are printed on opposite pages to the particular kinds illustrated by the cuts. The following additional lines are represented in the catalogue: Buckles, Patent Breaching Dees, Sensible Layer Loops, Halter Bolts, Economy Halter Trimmings, Buckeye Gag Runners, German Snaps, Loop Bolt Pad Hooks, Buckeye Team Pad Hooks, Gig Trees, Pad Plate Screws, Bearer Loops, Wire Ring Bits, Wire Snaffles, Stirrups, Hame Back Strap Rings, Hame Rivets and Gig and Coach Hames. The manufacturers state that they now list but one size of Harness Rings instead of Light and Heavy, as heretofore, the one size being from a new line of patterns carefully proportioned. In order to serve the convenience

of any of their customers who may desire to order the goods as heretofore, without adopting the system followed in the catalogue, the manufacturers indicate that there will be no objection to that course, and that the customary usage of figured description can be continued until the lettered one recommends itself. They then add that the changes on familiar numbers are so few, and the advantage of having no duplicate numbers so great, and the future so long compared with the limited time their list has been before the trade, that they apprehend but a short period will elapse before the trade will appreciate the advantages adopted and introduced. Stock-keepers will be furnished with comparative lists of old and new numbers. The list is very satisfactory and creditable, and the trade will appreciate the care that has been taken in its compilation.

ENGLISH VS. AMERICAN AXES IN AUSTRALIA.

This subject continues to excite much attention among English manufacturers and merchants, who are earnestly considering the reasons for the favor which the American Axe finds, and the means by which the English Axe can be brought to take its place. Relating to the letter of Mr. J. Macintosh, which we reproduced in our last issue, the following communication appeared in a recent number of the *Ironmonger*:

I have read with interest the several letters that have appeared in your valuable paper, but my attention has been more particularly drawn to that of Mr. J. Macintosh, Sydney, which is inserted in your issue of the 18th inst., wherein my name is brought prominently forward, together with that of W. Gilpin & Co., as having in those days—I presume about 20 or 25 years ago—made "an excellent article;" also "that we had almost a monopoly of the Axe and Adze trade of Australia." I think it right to draw attention to the fact, as Mr. Macintosh infers that this was before the discovery of gold in the colonies; at that time the "Collins" or Yankee Axe was unknown, and the older West Indian patterns were in vogue. These patterns I am now regularly sending to Sydney and other parts of Australia, but, of course, in smaller quantities, the Yankee Axe having almost superseded them from the day it was introduced. It is asked, "Why don't the English manufacturers make the same pattern?" They do, or pretend to. American manufacturers took advantage of the time when gold was discovered to send out a really good article, and not only this, they were determined to get a footing in the market, which they knew must grow; they sold them at a low price, or even, I am told, in many instances gave them away, so that they should be used, the result of which we now see. About this time, or soon after, the merchants sent home orders for English-made Axes in imitation of the Yankee pattern, but (so my late father always gave me to understand) at such a price that it was next to impossible to make them for without it was of very inferior quality. In some instances I have heard that they had little or no steel put in them at all; they were highly polished and japanned—in fact, made to take the eye, instead of being made for use. When such goods are put upon a market and their quality is found out how can anybody be surprised at hearing that "Axe, when offered for sale by auction, realized little more than bar iron?"

Mr. Macintosh goes on to say: "We then sold Gilpin's and Lyndon's Solid Steel and Steel-Poled Falling Axes for 9d. per pound, and their make of Broad Axes for 1/4 per pound, of a quality that would cut a nail or take chips from an iron bar without injury to the edge; yet neither description of the English Axe or Adze was reliable in temper. When used in cutting or hewing our iron-bark timber, pieces upward of a square inch would frequently fly off, more especially the shipwrights' Axes and Adzes." In this, I think, Mr. Macintosh must be in error—he must be speaking of the American-shaped Axes, as the English pattern shipwrights' Axes and the West Indian pattern falling Axes are made in a different manner to the Yankee Axe. In the former the steel is supported with iron on either side, whereas in the latter the steel has no support. It is very possible in case of a "water crack" in the steel that a piece may break off the Yankee-shaped Axe, and about 20 years ago our manufacturers did not know so much about hardening and tempering as they do now. But what I complain of most is that the merchants, when they discovered our faults, did not inform us of them at the time through their agents. They knew very well the manufacturers here had no representatives in the colonies, and it was their place, if they had any regard for the English manufacturers at all, to have given them that information they could, instead of which, in many instances, they cared little for the manufacturer so long as they got their profits, and, unless goods were ordered of a special make, they went to little makers without looking to the future. With regard to the handling and packing of Axes, I believe it is a well known fact that we have not the facilities of the Americans. America is a timber-growing country, and naturally cases are produced much cheaper there than here. Again, we have to import the Handles that are made in America from wood that grows in large quantities there. It was not the fault of the manufacturers of this country that their Axes were sent out without Handles; they only carried out the merchants' instructions and made the Axes; the merchants, to save expense and freight, shipping the Handles direct from the States to Australia, to be fitted (I presume) by the purchaser as best he could. One need hardly wonder which was the more taking article. Then, again, after all this trouble, and taking his Axe miles into the bush, far away from a "blacksmith's shop or even a grindstone," one cannot be surprised, when the quality turned out to be so inferior as I have mentioned above, that the bushmen gave up in despair the English Axe. Of course there are manufacturers who can and do make Axes of good quality, but the merchants do not trouble them much; their price is too high. I do not wish to be egotistical, but, being, as it were,

put upon my defense by Mr. Macintosh's letter, I unhesitatingly say that I not only can, but do, make an Axe equal, if not superior, in quality to the best American make. It is many years since any of my axes broke from having "water cracks" in them, and even if any should now occur, it is impossible for them to be sent out, as I have long since found out a method by which they are bound to be discovered. With regard to price, I do not know the present quotations for the best American Axes, or the difference in freight from America and England to Sydney, but there is one thing to be considered, and that is, although there is a high tariff on steel imported into America, the manufacturers there have the benefit of a rebate on the exported goods made of that steel.

I am, sir, yours truly, W. A. LYNDON.
Minerva Works, Birmingham, April 23.

AGRICULTURAL IMPLEMENTS IN INDIA.

The following views and suggestions are given to the trade in this country by Consul-General Mattson, of Calcutta, in the hope that American manufacturers may take judicious action in view of the exhibition to be opened at Calcutta next December, and avail themselves of the opportunity of extending their trade which will then be afforded them:

The Indian "ryots" (agriculturists) cultivate 200,000,000 acres of land, and plow the same from two to five times every year, with no better implement than a pointed wooden stick, which does not turn over the soil, but only stirs and shakes it to the depth of 3 or 4 inches. The enormous quantity of small grain annually produced on these 200,000,000 acres is cleaned and separated for food and for the market by the same system of hand-winning which was in use among the Israelites of old, and which, for the European grain trade at least, is now deemed inefficient. The Indian agriculturist—ryot—can in no sense be compared to the American farmer, but rather to the late serf of Russia. He is a tenant on hard conditions, and is, by custom and bigotry, almost a fixture on the particular spot of land where he was born; his farming is done on a very small scale and according to old methods, to which he clings with religious veneration; his wants are very few, and he endures poverty and even hunger with patience; he cultivates his patch of 5 to 15 acres on shares for the landed proprietor—"zemindar"—who holds "under rental to the Government, and the better half of his gross income generally goes to the zemindar, the priest (Brahmin) and the usurer, in the form of rent, presents, offerings and interest, and if he can not so cents a day by his hard and hopeless labor that will suffice for the most pressing wants of his household. His home is a mud or bamboo hut; his property a pair of small bullocks, a few cows, calves and goats, a wooden cart, and a few brass and earthen pots—in all worth about \$50; and his implements and tools are of the rudest kind, such as his ancestors used 1000 years ago. And yet he is making some progress under British rule, and finds his wants increasing and at the same time better outlets for his produce and more recompense for his labor, and, on the whole, is so independent on 10 cents a day that he will eat or store his wheat rather than sell it below a certain price. Of course he does not employ machinery in farming, but plows his land with a crooked piece of iron-pointed wood, harrows it with an implement resembling a common ladder laid flat on the ground and dragged by the little bullocks crossways over the field; he sows by hand, reaps with a rude sickle, carries the sheaves home on his back or in the bullock cart, threshes them with a wooden club, or lets the cattle tramp out the grain, and cleans it by hand-winning.

Then, again, the cutting up of the land into small patches, to suit the rapidly increasing population and for irrigation purposes, the absence of roads and bridges, the want of strength in draft animals, the poverty of the people, and other reasons, make it impossible to farm on a larger scale and to use machinery; but even if all these objections were removed, the present cost of labor is too low even for the successful competition of Farm Machinery, and it may be regarded as certain that the cost of wheat as now produced is at or near the very lowest possible minimum, and when it does not bring 50 to 60 cents a bushel to the ryot it will be consumed at home in lieu of other breadstuffs, and the wheat area will be temporarily diminished. While, for reasons stated in my former reports, Agricultural Implements such as are manufactured in the United States are not adapted to India, there is an important exception in respect to the Plow and Fanning Mill. The small American Garden Plow, which turns a furrow of 8 or 9 inches and is so light that a 10-year old boy can carry it on his shoulder, and a good sized pony can work it in the field, is, in my judgment, the very Plow to introduce into India, where an immense market awaits the successful manufacturer. It would, however, have to be made somewhat different from the home model; the beam should be very light and long (much like a common wagon tongue), with a slight incline upward, so that the end could be fastened with a clevis to the yoke of a pair of bullocks of the size of common two-year-old American country steers (the cattle here are yoked so far apart that there is room close to their hind feet for the working of the Plow); the handle or handles should stand nearly upright in order that the plowman may walk so near his cattle that he can readily catch hold of their tails, because the Indian bullock driver will insist on regulating the motion of his cattle by jerking and twisting their tails near the root with his hands. In all other respects it should be like our light Garden Plow, with a high polish, so as to scour easy in the wet, heavy soil, but otherwise the finish might be plain and cheap, so that the Plow would come within the means of the poor tenantry who compose the agriculturists of India.

The Fanning Mill should be made with special reference to cleaning and separating wheat for the European market, and should be small, light and cheap. It is very seldom that one ryot has more than 50 or 60 bushels of wheat to clean, and time is of no special object to him; the mill, therefore, need not

be made to do much work in a day, but rather to do it well. A little village community would probably become joint owners of one such mill, but there are 450,000 agricultural villages in India, and in many instances the "zemindar" (land proprietor) would buy it and let it out on hire to his tenants. Many attempts have been made to introduce these implements from Europe, but so far the samples have proved too heavy and expensive. There is a universally acknowledged want for both of them, and arrangements can easily be made for their trial at the Government experimental farms.

Cost of Unloading and Loading Freight.

A prominent railroad manager in 1874 requested an assistant to tally and value for a few days the time actually consumed by the laborers, freight checkers, foremen, coopers, sweepers and sealers engaged in unloading and loading freight at one of the depots at Jersey City. Some 305 cars were thus tallied, and although this included but one handling, while almost invariably there must be several handlings before the freight is finally got rid of, the results were so curious, as indicating the influence of the shape and weight of the package upon the cost, that we have tabulated them. We reproduce these figures, which are of special interest. Attention is invited to the economy shown in handling rolling freight, as distinguished from boxes, bags, etc.; also, to the greater cost caused by care, as in the case of glassware, eggs, etc.; to the saving effected by the use of tackle over hand labor, as shown in unloading iron, acids and sulphur; to the increased cost caused by mere size in the same articles, as illustrated by marble.

Cost of Unloading Freight—One Handling.

No. of cars.	Kind of Freight.	Tons in car.	Cents per ton.	Cents per car.
1	Pearl ash, in tierces.....	12	4	48
1	Petroleum, in barrels.....	10	6.8	68
3	Glassware, in barrels.....	4	13.6	54
2	Zinc ore, in bags.....	19	3.4	41
4	Iron beams (tackle used).....	18	3.6	46
2	Iron, in bundles and bars.....	18	18.6	229
3	Iron heavy beams.....	19	46.8	561
1	Iron built beams (tackle used).....	18	17.1	206
1	Wrought water-pipe.....	10	25.9	259
11	Pig iron (tackle used).....	10	11.1	111
3	Acids, in carboys (tackle used).....	10	4	40
2	Marble, medium blocks (tackle used).....	13	4.5	54
2	Marble, large blocks (tackle used).....	12	15.7	188
1	Sulphur in bulk (tackle used).....	9	7.8	73
14	Miscellaneous freight.....	10	13.1	118
1	Timber, single sticks.....	12	23.7	284
1	Timber, single sticks.....	11	32.2	365
2	Shooks, in bundles.....	10	12.3	123
2	Pine doors, in bundles.....	9½	31.8	302

The above indicates that the cost of unloading, if confined to one handling, is approximately as follows:

For tierces.....	Cents per ton.	For medium boxes.....	Cents per ton.
For tierces.....	4	For light boxes.....	14
For barrels.....	6	For miscellaneous freight.....	14
For hogheads.....	8	For grain in bulk.....	5
For bags.....	10		
For sacks.....	10		
For bales.....	13		

Cost of Loading Freight—One Handling.

No. of cars.	Kind of Freight.	Tons in car.	Cents per ton.	Cents per car.
1	Cement, in barrels.....	19	3.1	37
1	Powder, in kegs.....	19	0.3	112
20	Miscellaneous freight.....	7	10	70
4	Fire-brick, loose.....	10	8	20
3	Sand, loose.....	12	8.3	100
1	Coal, by steam.....	12	5	60
1	Coal, by hand.....	12	10.4	126

The cost of loading, as might be expected, is seen to be in excess of the cost of unloading, but the variety of articles experimented upon was not sufficiently great to warrant drawing any very definite conclusions as to the cost. Attention is called to the cost of loading the two cars of coal. The one which was loaded by steam-power cost less than half as much as the one which was loaded by hand. This, together with the results shown by the use of tackle in the unloading of iron, confirms the opinion that steam or hydraulic power might be used far more than it is in handling freight at depots with very great resulting economy. It would be interesting to follow up this experiment, by ascertaining the cost of handling freight at local stations and at various points where traffic originates. In this case it would be necessary to include all the handlings which the freight receives, between the initial or final delivery and the railroad car. These are seldom less than two, and frequently more, consisting generally in the receipt at the platform, and trucking into the house, the sorting out into piles according to destination, and the trucking and loading into the cars. The consequence is that, while the above tables show a cost varying from 4 to 57 cents a ton, the average cost at the station where the investigation was made; was at the time some 34 cents a ton and the average cost of station service for all freights in 1872 was 31.62 cents a ton on the New York Central and 31.88 cents a ton on the Erie Railway.

In anticipation of possible erroneous impressions and rumors among the trade concerning the misunderstanding existing between himself and his molders, Mr. O. A. Blessing, of Philadelphia, presents the following statement of the case: About the middle of January last, owing to the general business depression, low prices, accumulation of stock, &c., a reduction of 10 per cent. in wages was proposed, which was accepted by the molders. No promise as to the length of time the reduction should remain in force was made by Mr. Blessing. In the spring of 1884, business being very active with him, an increase of 10 per cent. was made in the molders' wages. When the present reduction was proposed the molders gave one day's notice that unless last year's rates were restored they would strike. In view of the fact that he has a large stock of cast-iron goods on hand, that prices are low, with little prospect of improvement, and also that he might have to stop temporarily on account of erecting new buildings, Mr. Blessing decided to shut down his works.

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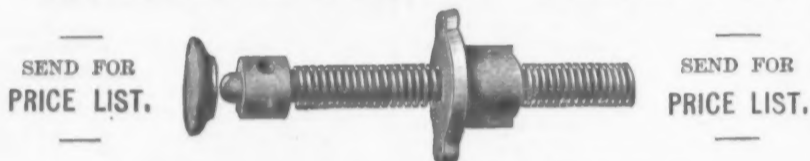



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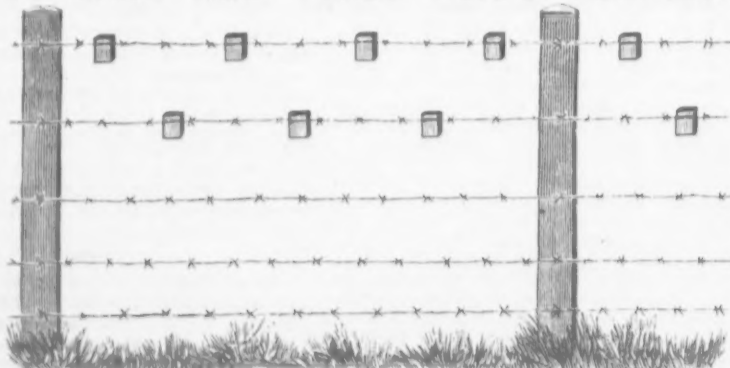
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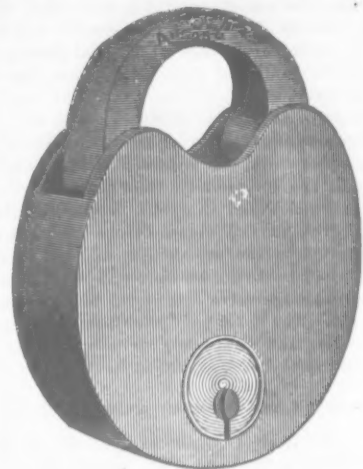
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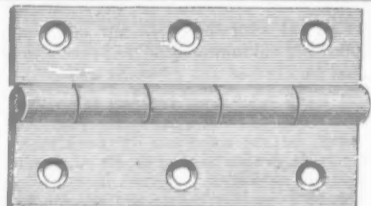
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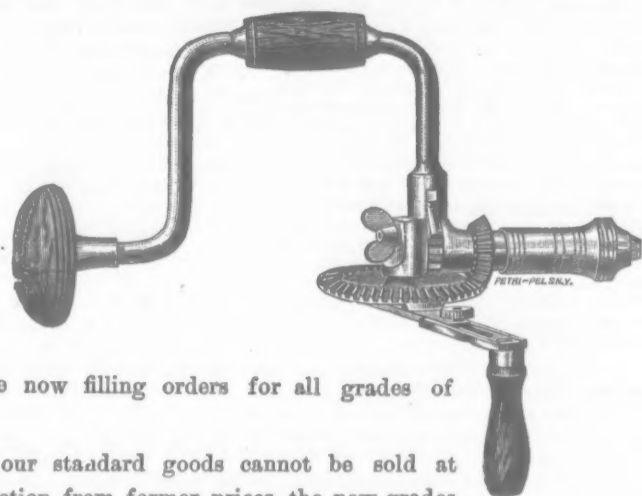
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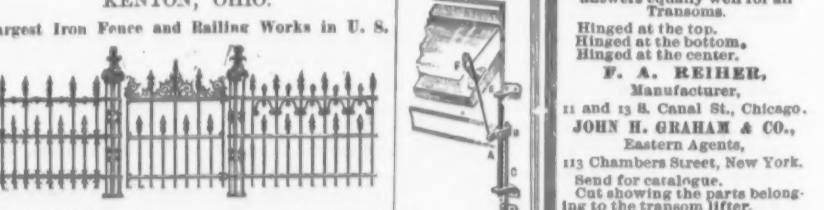
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Globe and Angle Valves, Flanged, with Yoke.....Each	.50	.60	.75	.85	1.00	1.10	1.25	1.35	1.50	1.60	1.75	1.85	2.00
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Cross Valves, Flanged.....Each	1.00	1.10	1.25	1.35	1.50	1.60	1.75	1.85	2.00	2.10	2.25	2.35	2.50
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Globe and Angle Safety Valves, Screwed.....Each	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00
Globe and Angle Safety Valves, Flanged.....Each	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00
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Throttle Valves, Screwed.....Each	1.00	1.10	1.25	1.35	1.50	1.60	1.75	1.85	2.00	2.10	2.25	2.35	2.50
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Radiator Valves, Rough Body, Patent Wood Wheel.....Each	1.40	1.55	1.65	1.80	1.95	2.05	2.20	2.35	2.45	2.60	2.70	2.85	2.95
Radiator Valves, Finished Body, Patent Wood Wheel.....Each	1.60	1.75	1.85	2.00	2.15	2.25	2.40	2.50	2.65	2.75	2.90	3.00	3.10
Radiator Valves, Finished Body, Patent Wood Wheel, Nickel Plated.....Each	1.90	2.15	2.25	2.40	2.55	2.65	2.80	2.90	3.05	3.15	3.30	3.40	3.50
Radiator Valves, Rough Body, Patent Wood Wheel, with Union, Nickel Plated.....Each	1.70	2.05	2.15	2.30	2.45	2.55	2.70	2.80	2.95	3.05	3.20	3.30	3.40
Radiator Valves, Rough Body, Patent Wood Wheel, with Union, Nickel Plated.....Each	2.05	2.30	2.40	2.55	2.65	2.80	2.90	3.05	3.15	3.30	3.40	3.50	3.60
Radiator Valves, Finished Body, Patent Wood Wheel, with Union, Nickel Plated.....Each	2.30	2.55	2.65	2.80	2.90	3.05	3.15	3.30	3.40	3.50	3.60	3.70	3.80
Radiator Valves, Finished Body, Patent Wood Wheel, with Union, Nickel Plated.....Each	2.55	2.80	2.90	3.05	3.15	3.30	3.40	3.50	3.60	3.70	3.80	3.90	4.00
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Three-Way Cocks, Screwed.....Each	.85	.95	1.05	1.15	1.25	1.35	1.45	1.55	1.65	1.75	1.85	1.95	2.05
Three-Way Cocks, Flanged.....Each	.85	.95	1.05	1.15	1.25	1.35	1.45	1.55	1.65	1.75	1.85	1.95	2.05
Service Cocks.....Each	.55	.65	.75	.85	.95	1.05	1.15	1.25	1.35	1.45	1.55	1.65	1.75
Service Cocks, Male and Female.....Each	.65	.75	.85	.95	1.05	1.15	1.25	1.35	1.45	1.55	1.65	1.75	1.85
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Expansion Joints, Screwed.....Each	1.25	1.40	1.50	1.65	1.75	1.90	2.00	2.15	2.25	2.40	2.50	2.60	2.70
Diameter Blank Shank.....Each	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	2.00	2.10	2.20
Rough Steam Bibbs.....Each	1.25	1.40	1.50	1.65	1.75	1.90	2.00	2.15	2.25	2.40	2.50	2.60	2.70
Finished Steam Bibbs.....Each	1.25	1.40	1.50	1.65	1.75	1.90	2.00	2.15	2.25	2.40	2.50	2.60	2.70
Rough Steam Bibbs, with Coupling on Nose.....Each	1.25	1.40	1.50	1.65	1.75	1.90	2.00	2.15	2.25	2.40	2.50	2.60	2.70
Finished Steam Bibbs, with Coupling on Nose.....Each	1.25	1.40	1.50	1.65	1.75	1.90	2.00	2.15	2.25	2.40	2.50	2.60	2.70
Size.....	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5
Mississippi Gauge Cocks, Blank Shank.....Each	\$0.60	\$0.75	\$1.00	\$1.25	\$1.50	\$1.75	\$2.00	\$2.50	\$3.00	\$3.50	\$4.00	\$4.50	\$5.00
Air Pumps.....Each	15.00	18.00	20.00	22.00	24.00	26.00	28.00	30.00	32.00	34.00	36.00	38.00	40.00
Gas-Proving Pump, with Mercury Gauge.....Each	25.00	30.00	35.00	40.00	45.00	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00
Gas-Proving Pump, with Air Gauge and Ether Cup.....Each	30.00	35.00	40.00	45.00	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00

STEAM ENGINE TRIMMINGS.

Size.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5
Locomotive Oil Cups.....Each	\$0.25	\$0.40	\$0.50	\$0.60	\$0.75	\$1.00	\$1.25	\$1.50	\$1.75	\$2.00	\$2.25	\$2.50	\$2.75
Plain Oil Cups.....Each	.25	.40	.50	.60	.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75
Fancy Top Oil Cups.....Each	.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75
Octagon Oil Cups.....Each	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25
Oil Cups, with Stop Cock, Tee Handle.....Each	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
Oil Cups, with Stop Cock, Lever Handle.....Each	1.10	1.35	1.60	1.85	2.10	2.35	2.60	2.85	3.10	3.35	3.60	3.85	4.10
Patent Glass Engine Oil Cups.....Each	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
Lubricators.....Each	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75
Lubricators, with Tee Handle.....Each	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00
Globe Oil Cups.....Each	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00
Globe Oil Cups, Lever Handle.....Each	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00
Compression Globe Oil Cups.....Each	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00
Size.....	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5
Air Cocks, Tee Handle.....Each	\$0.40	\$0.45	\$0.55	\$0.65	\$0.75	\$0.85	\$1.00	\$1.10	\$1.20	\$1.30	\$1.40	\$1.50	\$1.60
Air Cocks, Tee Handle, Double Thread.....Each	.45	.50	.60	.70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60
Bibb Air Cocks, Tee Handle.....Each	.80	.85	.95	1.05	1.15	1.25	1.35	1.45	1.55	1.65	1.75	1.85	1.95
Bibb Air Cocks, Tee Handle, Hose End.....Each	.70	.75	.85	.95	1.05	1.15	1.25	1.35	1.45	1.55	1.65	1.75	1.85
Bibb Air Cocks, Tee Handle, Hose End.....Each	.85	1.05	1.25	1.45	1.65	1.85	2.05	2.25	2.45	2.65	2.85	3.05	3.25
Cocks for Steam Gauges.....Each	1.85	2.00	2.15	2.30	2.45	2.60	2.75	2.90	3.05	3.20	3.35	3.50	3.65
Cocks for Steam Gauges, with Coupling, Tee Handle.....Each	2.00	2.15	2.30	2.45	2.60	2.75	2.90	3.05	3.20	3.35	3.50	3.65	3.80
Cylinder Cocks, Tee Handle, Blank Shank.....Each	.75	.85	.95	1.05	1.15	1.25	1.35	1.45	1.55	1.65	1.75	1.85	1.95
Cylinder Cocks, Tee Handle, Blank Shank.....Each	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	2.00	2.10	2.20	2.30
Blank Shank.....Each	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5
Diameter Opening.....Each	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	2.00	2.10	2.20
Cylinder Cocks, with Single Coupling, Rough.....Each	1.75	1.90	2.05	2.20	2.35	2.50	2.65	2.80	2.95	3.10	3.25	3.40	3.55
Cylinder Cocks, with Single Coupling, Rough.....Each	1.75	1.90	2.05	2.20	2.35	2.50	2.65	2.80	2.95	3.10	3.25	3.40	3.55
Cylinder Cocks, with Single Coupling, Finished.....Each	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00
Cylinder Cocks, with Double Coupling, Finished.....Each	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00
Size.....	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5
Compression Gauge Cocks, Hayden's No. 3.....Each	\$1.10	\$1.20	\$1.30	\$1.40	\$1.50	\$1.60	\$1.70	\$1.80	\$1.90	\$2.00	\$2.10	\$2.20	\$2.30
Compression Gauge Cocks, Hayden's No. 3, with Stuffing Box.....Each	1.30	1.40	1.50	1.60	1.70	1.80	1.90	2.00	2.10	2.20	2.30	2.40	2.50
Water Gauges, Rough Body, 2 Rods, 3/4-inch Glass, 1/2-inch Pipe, Iron Wheels.....Each	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00
Water Gauges, Rough Body, 2 Rods, 3/4-inch Glass, 1/2-inch Pipe, Patent Wood Wheel.....Each	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00	6.25	6.50	6.75
Water Gauges, Rough Body, 4 Rods, 3/4-inch Glass, 3/4-inch Pipe, Patent Wood Wheel.....Each	8.00	8.50	9.00	9.50	10.00	10.50	11.00	11.50	12.00	12.50	13.00	13.50	14.00
Water Gauges, Finished Body, 2 Rods, 3/4-inch Glass, 1/2-inch Pipe, Patent Wood Wheel.....Each	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00	6.25	6.50	6.75	7.00	7.25
Water Gauges, Finished Body, 2 Rods, 3/4-inch Glass, 1/2-inch Pipe, Patent Wood Wheel.....Each	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00	6.25	6.50	6.75	7.00	7.25
Water Gauges, Finished Body, 4 Rods, 3/4-inch Glass, 3/4-inch Pipe, Patent Wood Wheel.....Each	10.00	10.50	11.00	11.50	12.00	12.50	13.00	13.50	14.00	14.50	15.00	15.50	16.00
Water Gauges, Finished Body, 4 Rods, 3/4-inch Glass, 3/4-inch Pipe, Patent Wood Wheel.....Each	10.00	10.50	11.00	11.50	12.00	12.50	13.00	13.50	14.00	14.50	15.00	15.50	16.00
Diameter of Bell.....Each	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	4 1/4
Steam Whistles, without Valve.....Each	\$1.70	\$2.00	\$2.30	\$2.60	\$2.90	\$3.20	\$3.50	\$3.80	\$4.10	\$4.40	\$4.70	\$5.00	\$5.30
Steam Whistles, with Valve.....Each	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00	6.25	6.50
Size.....	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5
Whistle Valves.....Each	\$2.25	\$2.75	\$3.25	\$3.75	\$4.25	\$4.75	\$5.25	\$5.75	\$6.25	\$6.75	\$7.25	\$7.75	\$8.25

IRON AND IRON BODY WORK, BRASS MOUNTED.

Size.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	11	12 in.
	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Globe and Angle Valves, Screwed.....Each					2.00	2.50	3.50	5.00	8.00	7.50	10.50										
Globe and Angle Valves, Flanged.....Each					3.00	3.75	5.00	6.75	9.50	9.50	13.50										
Globe and Angle Valves, Screwed, with Yoke.....Each									8.00	10.50	14.00	18.00	21.00	35.00	32.00	44.00	75.00	85.00	135.00		300.00
Globe and Angle Valves, Flanged, with Yoke.....Each									9.75	12.50	17.50	21.50	35.00	32.00	36.00	49.00	80.00	91.00	145.00		230.00
Horizontal, Vertical and Angle Check Valves, Screwed.....Each					1.50	2.25	2.75	3.75	6.25	9.75	12.75	15.75	19.00	34.00	38.00	38.00	60.00	71.00	110.00		170.00
Horizontal, Vertical and Angle Check Valves, Flanged.....Each					2.50	3.50	4.25	5.50	8.25	12.75	16.25	19.00	34.00	38.00	38.00	60.00	71.00	110.00			190.00
Cross Valves, Screwed.....Each								5.00	13.00	18.00											190.00
Cross Valves, Flanged.....Each								6.00	13.00	18.00											260.00
Cross Valves, Screwed, with Yoke.....Each								9.50	16.00	18.00	22.00	27.00	35.00	40.00	54.00	80.00	105.00				260.00
Cross Valves, Flanged, with Yoke.....Each								12.00	19.00	22.00	28.00	33.00	41.00	45.00	61.00	95.00	114.00				260.00
Gate Valves, Screwed.....Each								7.00	10.00	13.00	16.00	18.00	21.00	25.00	31.50	45.00					
Gate Valves, Flanged.....Each								8.00	13.00	18.00	24.00	30.00	36.00	44.00	60.00						
Globe and Angle Safety Valves, 1/2" d.....Each		2.50	3.50	5.00	6.00			7.00	10.00	15.00	19.00	24.00									
Globe and Angle Safety Valves, 1" d.....Each		3.50	5.00	6.75	8.25	10.50	16.00	22.00	29.25	36.00	42.00	50.00	67.50								
Butterfly Valves, Screwed.....Each					3.00	3.50	4.50	6.00	8.00	12.00	16.00	20.00									
Butterfly Valves, Flanged.....Each					4.00	4.75	6.00	7.75	10.00	15.00	19.00	24.00									
Throttle Valves, Screwed.....Each					8.00	10.00	12.00	15.00	24.00	32.00	40.00	48.00									
Throttle Valves, Flanged.....Each					9.00	11.25	13.50	16.25	26.00	35.00	43.50	52.00									
Back-Pressure Valves, Screwed.....Each								7.00	8.00	15.50	14.50	18.00	21.00	28.00	32.00	44.00	75.00	85.00	135.00		300.00
Back-Pressure Valves, Flanged.....Each								8.00	8.75	12.50	17.50	21.00	25.00	32.00	36.00	48.00	80.00	91.00	145.00		280.00
Foot Valves and Strainers, Screwed.....Each					1.00	1.25	1.50	2.00	2.50	5.00	7.50	10.00									
Foot Valves and Strainers, Flanged.....Each					2.00	2.50	3.00	4.00	5.00	8.25	8.50	11.00	14.00								
Iron Cocks, Screwed.....70 75 80								2.00	2.60	4.50	5.12	6.00	7.00	17.00	22.00						
Iron Cocks, Flanged.....Each								1.65	2.25	2.75	3.50	4.35	5.25	9.50	15.50	20.00					
Iron Cocks, with Brass Plugs, Screwed.....1.00 1.10 1.25 1.50								2.25	3.00	2.75	4.00	4.75	5.50	10.00	16.00	20.00					
Iron Cocks, Three-Way, Screwed.....Each								5.50	7.75	11.50	16.00	20.00	24.00								
Iron Cocks, Three-Way, Flanged.....Each								6.00	8.00	15.00	20.00	24.00	30.00	40.00	55.00						
Iron Cocks, Three-Way, with Brass Plugs, Screwed.....Each								6.50	9.00	13.00	20.00	26.00	36.00	46.00	61.00						
Expansion Joints, Screwed.....Each					3.00	4.00	5.00	7.00	9.00	14.00	20.00	28.00	35.00								
Expansion Joints, Flanged.....Each								11.00	15.00	17.50	25.00	30.00	40.00	45.00	65.00	100.00					
For Brass Washers on Iron Cocks, add to list.....Each					10.00	10.00	15.00	25.00	40.00	50.00	80.00	3.50		6.00	8.00	1.00					

Current Hardware Prices, May 13, 1885.

HARDWARE.

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Brackets.
Self, 100 Sargent's list dis 60&10
Self, fancy, Sargent's list dis 60&10&10
Reading, plain dis 60&10&5
Reading, Rose's dis 60&10

Bright Wire Goods.
List of June 25, 1883, dis 70&10&10 to 70&10&10&10
Broilers.—Henis' Self-Basting.
Inch 10 9 11
For do. \$4.50 6.50 6.50

Bull Hinges.
Union Nut Co. dis 55
Sargent's dis 55
Hobbs & Co. dis 30
Hudson, Beckley & Co.'s dis 70&10
Peck, Stow & W. Co.'s dis 50&10

Butts
Wrought Brass dis 70
Cast Brass, Tiebolt dis 40
Cast Brass, Corbin's Fast Joint dis 40
Cast Brass, Loose Joint dis 30
Fast Joint, Narrow dis 60&10&5
Fast Joint, Broad dis 70&10&5
Loose Joint, Japanned dis 70&10&5
Loose Joint, Jap. with Acorns dis 70&10&5
Mayer's Hinges dis 70&10&5
Loose Pin, Acorns dis 70&10&5
Loose Pin, Acorns dis 70&10&5
Loose Pin, Acorns, Jap. Pltd. Tibs dis 70&10&5
Fast Joint, Narrow, w/ Acorns dis 60&10&10 to 60&10&10 to 10
Fast Joint, Lt. Narrow dis 60&10&10 to 60&10&10 to 10
Fast Joint, Broad dis 60&10&10 to 60&10&10 to 10
Loose Joint, Japanned dis 60&10&10 to 60&10&10 to 10
Table Butts, Back Flaps, &c. dis 60&10&10 to 60&10&10 to 10
Inside Blind, Regular dis 60&10&10 to 60&10&10 to 10
Inside Blind, Light dis 60&10&10 to 60&10&10 to 10
Loose Pin, Wrt dis 60&10&10 to 60&10&10 to 10
Loose Pin, Light dis 60&10&10 to 60&10&10 to 10
Bronze Wrought dis 45&50&50 to 10

Spring Hinges.
Geer's Spring dis 30
Union Spring Hinge Co.'s dis 25 to 10
American Spring Hinge Co.'s dis 30
Gem Spring Hinges dis 20 to 10
Parker's Double Action dis 25
Union Mfg. Co. dis 25
Bommer's dis 25
Buckman's dis 25
Empire dis 60 to 10
Acme dis 50 to 10
Chicago dis 30 to 60 to 10
Blind Butts, Parker dis 50&50 to 10
Blind Butts, Palmer dis 50&50 to 10
Blind Butts, Seymour dis 70&25
Blind Butts, Lull & Porter dis 45 to 10
Blind Butts, Nicholson dis 45 to 10
Blind Butts, Butler dis 50
Blind Butts, Clark's, Nos. 1, 3, 5 dis 80 to 10
Blind Butts, Clark's, Nos. 1, 3, 5 dis 80 to 10
Blind Butts, Sargent's, Nos. 1, 3 dis 70 to 10
Blind Butts, Sargent's, No. 12 dis 70 to 10
Blind Butts, Sargent's, No. 12 dis 70 to 10
Blind Butts, Shepard's "Noiseless," Nos. 50, 60, 65, 75 and 55 dis 70 to 10 to 80 to 10
Blind Butts, Shepard's "Gravity," Nos. 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 411, 413, 415, 417, 419, 421, 423, 425, 427, 429, 431, 433, 435, 437, 439, 441, 443, 445, 447, 449, 451, 453, 455, 457, 459, 461, 463, 465, 467, 469, 471, 473, 475, 477, 479, 481, 483, 485, 487, 489, 491, 493, 495, 497, 499, 501, 503, 505, 507, 509, 511, 513, 515, 517, 519, 521, 523, 525, 527, 529, 531, 533, 535, 537, 539, 541, 543, 545, 547, 549, 551, 553, 555, 557, 559, 561, 563, 565, 567, 569, 571, 573, 575, 577, 579, 581, 583, 585, 587, 589, 591, 593, 595, 597, 599, 601, 603, 605, 607, 609, 611, 613, 615, 617, 619, 621, 623, 625, 627, 629, 631, 633, 635, 637, 639, 641, 643, 645, 647, 649, 651, 653, 655, 657, 659, 661, 663, 665, 667, 669, 671, 673, 675, 677, 679, 681, 683, 685, 687, 689, 691, 693, 695, 697, 699, 701, 703, 705, 707, 709, 711, 713, 715, 717, 719, 721, 723, 725, 727, 729, 731, 733, 735, 737, 739, 741, 743, 745, 747, 749, 751, 753, 755, 757, 759, 761, 763, 765, 767, 769, 771, 773, 775, 777, 779, 781, 783, 785, 787, 789, 791, 793, 795, 797, 799, 801, 803, 805, 807, 809, 811, 813, 815, 817, 819, 821, 823, 825, 827, 829, 831, 833, 835, 837, 839, 841, 843, 845, 847, 849, 851, 853, 855, 857, 859, 861, 863, 865, 867, 869, 871, 873, 875, 877, 879, 881, 883, 885, 887, 889, 891, 893, 895, 897, 899, 901, 903, 905, 907, 909, 911, 913, 915, 917, 919, 921, 923, 925, 927, 929, 931, 933, 935, 937, 939, 941, 943, 945, 947, 949, 951, 953, 955, 957, 959, 961, 963, 965, 967, 969, 971, 973, 975, 977, 979, 981, 983, 985, 987, 989, 991, 993, 995, 997, 999, 1001, 1003, 1005, 1007, 1009, 1011, 1013, 1015, 1017, 1019, 1021, 1023, 1025, 1027, 1029, 1031, 1033, 1035, 1037, 1039, 1041, 1043, 1045, 1047, 1049, 1051, 1053, 1055, 1057, 1059, 1061, 1063, 1065, 1067, 1069, 1071, 1073, 1075, 1077, 1079, 1081, 1083, 1085, 1087, 1089, 1091, 1093, 1095, 1097, 1099, 110

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Twine.					
No. 9, Flax Twine	and B Balls.	BC.	B.	
No. 12 "	" " "	246	216	...
No. 18 "	" " "	276	246	...
No. 24 "	" " "	294	276	...
No. 36 "	" " "	324	312	...
No. 48 "	" " "	354	342	...
No. 204, Mattress,	and "		504	
Chalk Line, Cotton,	B Balls.		228	
Mason Line, Linen,	" "		228	
3-Ply Hemp, 14 and B Balls	(Spring Twine), 14½; 3-				
Ply Hemp, 15 B Balls;	3-Ply Hemp, 15 B Balls,				
Wool-Cotton Wrapping,	5 Ball to 5; Wool, 6				
and 5 Ply Jute, ¼ B Balls, 1½; Wool,	6 or 6½				
Paper, 10¢; Cotton Mops—d, o, 12 and 15 to d, 17c					
Vases					
Solid Box.	dls 50&10 to 50&10&5				
Parallel, Fisher & Norris Double Screw.	dis 15&10				
Parallel, Stephens	do 20				
Parallel, Parker's	do 20 to 25¢				
Parallel, Wilson's	dis 56				
Parallel, Howard's	do 20				
Parallel, Bonney's	do 20				
Parallel, Merrill's	dis 15&20				
Parallel, Sargent's	dis 5				
Parallel, Backus and Colwell	dis 5				
Parallel, Double Screw Leg.	dis 15&10				
Parallel, Prentiss	dis 50&25				
Parallel, Simpson Adjustable	dis 25				
Saw Fillets, Bonney's, Nos. 2 & 3.	¶ dos \$15.00, dis 40				
Saw Fillet, Stearn's	dis 40				
Saw Fillet Hopkins'	dis 40				
Saw Fillet, Reading	dis 40&15				
Saw Fillet, Wentworth	dis 30&10				
Cowell Hand Vise	dis 35				
Richardson's Vice and Anvil	dis 35				
Washer Cutters.					
Smith's Patent.	¶ dos \$12.00, dis 20&10&10				
Johann's.	¶ dos \$11.00, dis 35½				
Fenny's.	¶ dos Pol. 1st Jan'y d., dis 55				
Appleton's	\$ 8 do 10, dis 10&10				
Bonney's	dis 30&10				
Washtubs.—See Nuts and Washers					
Well Wheels—S-in, £1.35; L, £2.15; 12-in, £2.90					
Wire.					
Brass and Copper, new Flat, Jan. 18, 84, dis 30¢&30&5					
Hart, Bright and Annealed, No. 10 to 14.	dis 30¢&30&5				
Market, Coppered	dis 55¢&55&5				
Market, Galvanized	dis 60¢&60&5				
Market, Tinned, Tinne'd Wire	dis 60¢&60&5				
Stone, Bright and Annealed, No. 10 to 20.	dis 70¢&70&5				
Stove, Bright and Annealed, No. 27 to 30d½	dis 75¢&75&5				
Stone, Galvanized, No. 10 to 30.	dis 55¢&55&5				
Stone, Tinned, Tinned List	dis 60¢&60&5				
Tinned Droom Wire.	dis 55¢&55&5				
Cut Steel Wire	dis 55¢&55&5				
Annealed Fence, No.	dis 55¢&55&5				
Annealed Grape, No. 10 to 14.	dis 70¢&70&5				
Fence Staples	¶ B ¾, at 34¢				
Fence Staples, Galvaniz'd	dis 40¢				
Stub's Steel Wire.	dis 60 to c, d, 50				
Barb Fence.	See Trade Report				
Fire Safety Gage	dis 40				
Wire on Spools.	dis 65				
Steel Music Wire, No. 7 to 30.	csc ¶				
Picture Wire	dis 60&10				
Wire Clothes Lines, See Lines.					
Wire Cloth, green, drab and black, ¶ 100 sq ft.					
Wranches.—American Adjustable.					
Baxter's Adjustable "S"	dis 35½				
Baxter's Diagonal	dis 30&5				
Oose' Genuine	cash in 10 days, dis 60&5				
Oose' Mechanical	dis 100&10&5				
Oose' Pattern, Maltese	dis 75				
Oose' Pattern, Wrought	dis 75&10 to 75&10&5				
Girard Standard	dis 70				
Girard Agricultural	dis 75&10				
Bemis & Call's Patent Combination	dis 20				
Bemis & Call's Merrick's Pattern	dis 35				
Bemis & Call's Bridge's Pattern	dis 25				
Bemis & Call's Cylinder or Gas	dis 35				
Bemis & Call's No. 3 Pipe.	dis 35&5				
Aiken's Pocket (Bright)	do, dis 50&10				
The Favorite Pocket	do sc 50				
Weber's Patent Combination	dis 25				
Boardman's	dis 25&25&10				
Always Ready	dis 25				
Alligator	dis 40&10				
Doucheux Engineer	dis 25				
Acme, Bright	dis 35&5				
Acme, Nickeled	dis 45				
Acme, Bicycle, 4½ in.	dis 45				
Acme's					

SOLE MANUFACTURERS OF -

**THE AMERICAN
DYNAMO ELECTRO-PLATING
MACHINE.**

**Best Plating Machine
in the Market.**

HEADQUARTERS FOR
EVERYTHING
IN THE PLATING AND
POLISHING LINE.

Zucker & Levett Chemical Co.,

Established 1863. Incorporated 1881.

THE
Largest Manufacturers
IN THE WORLD OF

Nickel Anodes,
Nickel Salts,
Patent Muslin Buffs,
Polishing Lathes,
Polishing Felt,
Polishing Rouges,
Pol'ng Compositions
Walrus Leather,
Wood Emery Wheels
Platers' Brushes,
&c., &c., &c.

WORKS. OFFICES.

538 to 564 W. 16th St. 36 to 40 11th Ave. NEW YORK U. S. A.

WHOLESALE METAL PRICES, May 13, 1885.

METALS.

IRON.—Duty: Bars, 8-10¢ to 11-10¢; provided that no Bar Iron shall pay a less rate of duty than 35¢. Sheet, 11-0¢ to 15-10¢. Band, Hoop and Scroll, 1¢ to 4-10¢. Railroad Bars weighing more than 35 lb. yard, 7-10¢ of 1¢ lb.

Standard American Pig Iron.

Foundry No. 1. 19.00 @ 18.50
Foundry No. 2. 17.00 @ 17.50
Gray Forge. 16.00 @ 16.50

No. 1 Scotch Pig Iron.

Cambrose. 19.00 @ 19.50
Coltness. 21.00 @ 21.50
Shotts. 21.00 @ 21.50
Glasgow. 19.00 @ 19.50
Gartshore. 21.00 @ 21.50
Langloan. 21.50 @ 22.00
Summerlee. 21.00 @ 21.50
Dalmellington. 19.00 @ 19.50
Eglington. 18.00 @ 18.50
Clyde. 19.00 @ 19.50

Rails.

Steel, at Eastern mills. 26.50 @ 27.00
Old Rails, T. & S. 16.50 @ 17.00

Scrap.

Wrought, from yard. 18.50 @ 19.00

Bar Iron from Store.

Common Iron: 1.5 @ 1.7¢
1 to 1 in. round and square. 1.5 @ 1.7¢
Refined Iron: 1.8 @ 2.1¢
1 to 2 in. round and square. 1.8 @ 2.1¢
1 to 6 in. x 1/2 to 1 in. 1.9 @ 2.4¢
Rods—1/2 and 1-1/2 round and square. 2.1 @ 2.5¢
Bands—1 to 2-1/2 to No. 12. 2.1 @ 2.5¢
Burden's Best Iron, base price. 2.5¢
Burden's "H. B. & S." Iron, base price. 2.5¢
Norway Nail Rods. 6 @ 6¢

Sheet Iron from Store.

Common. 3.70 @ 3.80
R. G. American. 3.80 @ 3.90
Cleaned. 3.90 @ 4.00
Nos. 10 to 16. 3.70 @ 3.80
17 to 20. 3.80 @ 3.90
21 to 24. 3.90 @ 4.00
25 and 26. 3.80 @ 3.90
27. 3.90 @ 4.00
28. 3.80 @ 3.90
29. 3.90 @ 4.00

Brass and Copper Wire.

Galvanized, 10 to 20. 5 @ 5¢
Galvanized, 21 to 24. 5 @ 5¢
Galvanized, 25 to 28. 5 @ 5¢
Galvanized, 29. 5 @ 5¢
Galvanized, 30. 5 @ 5¢
American Russia. 10 @ 10¢
Russia. 10 @ 10¢
American Cold Rolled B. & S. 11 @ 11¢

Iron Wire.

STEEL.—Duty: Ingots, Bars, Sheets, &c., valued at 4¢ lb. or less, 45¢ ad. val.; valued above 4¢ and not above 7¢ lb., 2¢; valued above 7¢ and not above 10¢ lb., 2¢; valued above 10¢ lb., 3¢. Extra—Steel Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 1¢ lb. in addition to above; Steel Circular Saw Plates, 1¢ lb. in addition to the above.

American Cast Steel.

For American Steel, see Pittsburgh quotations.

English Steel.

Best Cast. 10 @ 10¢
Extra Cast. 10 @ 10¢
Circular Saw Plates. 10 @ 10¢
Round Machinery Cast. 10 @ 10¢
Swaged Cast. 10 @ 10¢
Best Double Shear. 10 @ 10¢
Blister, 1st quality. 10 @ 10¢
German Steel, Best. 10 @ 10¢
3d quality. 10 @ 10¢
3d quality. 10 @ 10¢
Sheet Cast Steel, 1st quality. 10 @ 10¢
3d quality. 10 @ 10¢
3d quality. 10 @ 10¢

TIN.—Duty: Plates, Sheets, Taper and Terno.

1¢ lb.; Bars, Block and Pig Iron. 20 @ 20¢
Banco. 18 @ 18¢
Straits. 18 @ 18¢
English. 18 @ 18¢
Bar. 18 @ 18¢

Charcoal Tin Plates.

C 10x14 225 sheets. 5.00 @ 7.00
C 12x12 225 sheets. 5.00 @ 7.00
C 10x20 112. 10.00 @ 14.35
C 12x12 225 sheets. 6.25 @ 8.75
C 10x20 112. 6.25 @ 8.75
C 12x12 17 100. 5.00 @ 7.00
C 10x20 112 100. 5.00 @ 7.00
For each additional 10 add. 1.25 @ 2.00

Coke Tin Plates.

C 10x14. 4.75 @ 4.80
C 12x12. 4.75 @ 4.80
C 10x20, gutters, 225 sheets. 8.00 @ 7.25
C 12x12, 112 sheets. 10.00 @ 10.50

Prime Plates.

C 14x20 M. F. 24 7/8 @ 6.875¢
C 14x20 Old Process. 6.50 @ 6.50
C 10x20 112. 10.00 @ 14.35
C 12x12 225 sheets. 6.25 @ 8.75
C 10x20 112. 6.25 @ 8.75
C 12x12 17 100. 5.00 @ 7.00
C 10x20 112 100. 5.00 @ 7.00
For each additional 10 add. 1.25 @ 2.00

Tin Boiler Plates.

LXX 14x20, 2 sheets for No. 7, 112 sheets. 12.00 @ 12.00
LXX 14x20, 2. 12.00 @ 12.00
LXX 14x20, 2. 12.00 @ 12.00

COPPER.—Duty: Pig Bar and Ingot, 4¢; Old

Copper, 3¢ lb. Manufactured (including all articles of which Copper is a component of chief value), 35¢ ad valorem.

Ingot, Lake. 11 1/2 @ 12¢
Ingot, Baltimore. 11 1/2 @ 11 1/2¢
Ingot Anchor. 11 1/2 @ 11 1/2¢
Crucibles Copper, ordinary sizes. 16 @ 17¢
16 oz. sq. ft. and over. 17 @ 17¢
Brassiers Copper, ordinary sizes. 16 @ 17¢
under 16 oz. and over 12 oz. 18 @ 18¢
Brassiers Copper, 10 oz. and 12 oz. 18 @ 18¢
16 oz. sq. ft. and over. 20 @ 20¢
Lighter than 10 oz. sq. ft. 20 @ 20¢
Circles less than 14 in. diam. 20 @ 20¢
84 in. diam. and over. 20 @ 20¢
Segment and Pattern Sheets. 20 @ 20¢
Locomotive Fire-Box Sheets. 17 @ 17¢
Sheeting Copper, over 12 oz. 16 @ 16¢
16 oz. sq. ft. 16 @ 16¢
Bolt Copper. 16 @ 16¢
Copper Bottoms. 18 @ 18¢
Nickel-Plated Sheet. 35 @ 35¢
Plating extra. 30 @ 30¢
Flat Copper Boiler Bottoms or Pit Bottoms, cut to special sizes. 21 @ 21¢

Tinning.

14x18, by the case. 1 sheet, 2¢
4x18, less than case. 8¢
For tinning both sides, double the above amount.

O'Neill's Patent Planished Copper.—Net.

14 and 16 oz. and heavier. By the case, 2¢ 3/4
18 oz. and lighter. 2¢ 3/4

Boiler Sizes.

7 in., 14x18, 8 in., 14x20, 9 in., 14x20.
14 and 16 oz. and heavier. By the case, 2¢ 3/4
(And all sizes not over 30 in. wide.)

Copper Wire.—(See Wire.)

Yellow Sheathing Metal. 30 @ 30¢

BRASS AND GERMAN SILVER.

Brown & Sharpe's Gauge the Standard for Metal;
Old English Gauge the Standard for Wire.
Brass Manufacturers' Price List, January 17, 1884.

LEAD.—Duty: Pig, 2¢; 10 lb.; Old Lead, 2¢

lb.; Pipe and Sheet, 3¢ lb.

Block Tin Pipe.

Tin Lined Pipe. 15¢, dis 20¢
Sheet. 6 1/2¢, dis 20¢
Shot. Drop, 5¢; Buck, 7¢
Chilled Shot. 7¢

ANTHONY.

Halsted's. 10 @ 10¢
Cookson. 10 1/4 @ 10 1/4¢

SPELTEN.—Duty: Figs, Bars and Plates, 1¢

100 lbs. 4 1/2¢ @ 4 1/2¢
American, cash. 4 1/2¢ @ 4 1/2¢
Bergenport. 4 1/2¢ @ 4 1/2¢

ZINC.—Duty: Pig or Block, 1¢; 100 lbs.

Sheet, 2 1/2¢ lb. 5 @ 5 1/2¢
600 lb. cases. 5 @ 5 1/2¢
Zinc—Open. 5 1/2¢ @ 5 1/2¢
Zinc Tubing. dis. 10 @ 20¢

PLAIN.

Fancy. 37
Scotch and Extra Patterns. 36

RABBIT METAL.

N. P. U. 10 @ 7 1/2¢
X. 10 @ 7 1/2¢
J. B. 10 @ 7 1/2¢

WIRE.

Market Wire.—Put up in 63 lb. bundles.

Nos. 00 to 9, 10, 11, 12, 13, 14, 15, 16, 17, 18.

10 11 11 1/2 12 1/2 14 15 16

Bright Market Wire. dis. 70¢
Charcoal. dis. 50¢
Bale Wire, Nos. 7 to 12. dis. 65¢
Annel Market Wire. dis. 70¢
Fence Wire, Nos. 8 and 9. dis. 60¢
Grape Wire, Nos. 10 to 14. dis. 70¢
Coppered Market Wire. dis. 65¢
Bale Wire, Nos. 7 to 12. dis. 60¢
Galvanized Market Wire. dis. 60¢
Fence Wire. dis. 60¢

Stone or Weaving Wire.

Nos. 16 17 18 19 20 21 22 23 24 25 26

Cents. 14 15 16 19 20 21 22 23 24 25 26

Nos. 27 28 29 30 31 32 33 34 35 36 37

Cents. 38 39 40 41 42 43 44 45 46 47 48

Nos. 16 to 18. dis. 70¢
19 to 20. 70¢
21 to 22. 70¢
23 to 24. 70¢
25 to 26. 70¢
27 to 28. 70¢
29 to 30. 70¢
31 to 32. 70¢
33 to 34. 70¢
35 to 36. 70¢
37 to 38. 70¢
39 to 40. 70¢
41 to 42. 70¢
43 to 44. 70¢
45 to 46. 70¢
47 to 48. 70¢
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67 to 68. 70¢
69 to 70. 70¢
71 to 72. 70¢
73 to 74. 70¢
75 to 76. 70¢
77 to 78. 70¢
79 to 80. 70¢
81 to 82. 70¢
83 to 84. 70¢
85 to 86. 70¢
87 to 88. 70¢
89 to 90. 70¢
91 to 92. 70¢
93 to 94. 70¢
95 to 96. 70¢
97 to 98. 70¢
99 to 100. 70¢

Galvanized Stone Wire.

Cast Steel, Steel Wire list. dis. 55¢

Brass and Copper Wire.

Old English Gauge the Standard.—Dis 20 @ 30.

Common High Low

Brass Bronze Copper.

All Nos. to No. 16, inclusive. \$0.22 \$0.25 \$0.30

No. 17 and 18. 24 25 31

No. 19 and 20. 24 25 31

" 21. 25 30 38

" 22. 26 30 38

" 23. 26 30 38

" 24. 26 30 38

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" 81. 26 30 38

" 82. 26 30 38

" 83. 26 30 38

" 84. 26 30 38

" 85. 26 30 38

Black Ivory Drop, fair.

Black Paint, in oil. 12 @ 12¢

Blue, Prussian, fair to best. 40 @ 55¢

" Chinese dry. 18 @ 30¢

" Ultramarine. 18 @ 30¢

" Brown, Spanish. 10 @ 12¢

" Van Dyke. 10 @ 12¢

" Green Chrome. 15 @ 22¢

" Paris. 14 @ 18 @ 25¢

" Iron Paint, Bright Red. 30 @ 35¢

" Purple. 30 @ 35¢

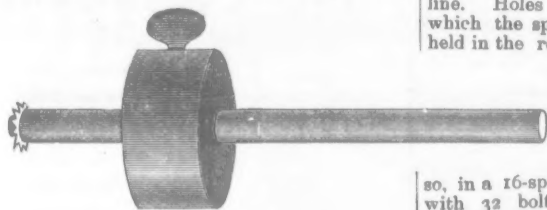
" Ground in oil, Bright Red. 30 @ 35¢

" " Brown. 30 @ 35¢

HARDWARE NOVELTIES.

Rotary Marking Gauge.

The Sandusky Tool Co., Sandusky, Ohio, are putting upon the market a Rotary Marking Gauge, illustrated below, which, in some of its features, is akin to the rotating plane described elsewhere. It is known as Kenney's

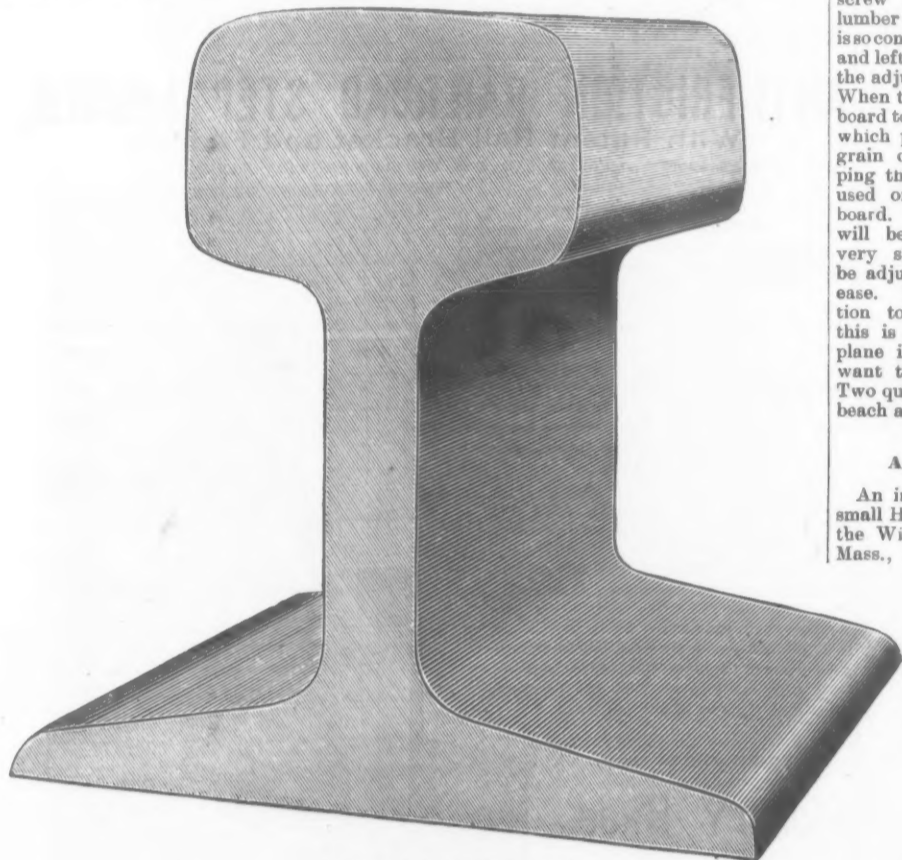


Rotary Marking Gauge.

rotary marking gauge. Instead of a blade on the end of the shaft by which to do the work, there is a fine tooth marker which rotates, thus stepping over instead of following the grain of the timber. This tool may be used in slitting thin stuff. Two qualities are manufactured—one having a bright steel rod and the other a nickel-plated rod.

Farmers' Steel Plow Anvil.

The accompanying illustration represents an Anvil for farmers' use, which is manufactured by Oliver Brothers & Phillips, Pittsburgh, Pa., for whom the Henry B. Newhall Company are agents, 105 Chambers street. It is exceedingly simple and needs but little description, being made from 68-pound steel T-rail, of the pattern represented in the cut and well finished. It is made of five sizes—3, 3½, 4, 4½ and 5 inches long—and is de-



Farmers' Steel Plow Anvil.

signed to meet the demand for a cheap and yet serviceable anvil for farmers' use. The cut represents the full size of the anvil.

The Smith Suspension Carriage Wheel.

An improved Suspension Carriage Wheel, the invention of M. L. Smith, has recently been put on the market by the Smith Sus-



Fig. 1.—General View of Wheel.

pension Carriage Wheel Company, Batavia, N. Y. The spokes of the wheel, a general view of which is shown in Fig. 1, are made of Bessemer steel rods, varying from ¼ to

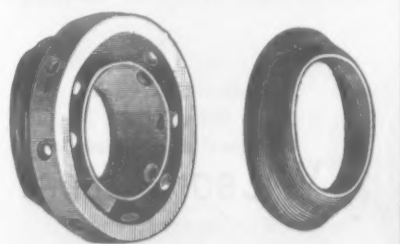


Fig. 2.—Hub Section and Flange.

¾ inch, for light and heavy wheels respectively. The felloes are of hickory, and for ordinary wheels are in two sections, and the tires, round or square edged, are made of sheet steel. The hubs consist of a wood sleeve, over each end of which is forced

with great pressure one of the sections shown in Fig. 2, which is made of malleable iron. Against the outer face of the hub-section the flange, shown at the right in the same cut, also malleable, is forced on, covering the recess. Each hub has two pairs of these sections, so that the hub ends of the spokes are "dodged" 2½ inches in ordinary wheels, while the rim ends are in a straight line. Holes are drilled in the hub through which the spokes pass and enter the nuts held in the recess shown in the cut. The

spokes are fastened to the rim by a thimble clip and two tire bolts as in Fig. 3. The bolts which fasten the clip to the felloe also hold the tire firmly in place; so, in a 16-spoke wheel the tire is fastened with 32 bolts. The end of the spoke passes through the thimble on the clip, fitting tightly, and is fastened with a head chambered in the clip. The spoke is protected ¾ inch in the hub and ¼ inch in the clip from the point at which the thread ends, so that



Fig. 3.—Section of Felloe, Showing Thimble Clip.

it is claimed there is no possibility of its breaking at that point. The Smith suspension-wheel is adapted to all styles and sizes

side, having an opening 1 inch in diameter. The central nozzle shown in the cut is ⅞ inch in diameter. The sprinkler is well made and is finished in nickel. The special merit claimed for it is that it will throw the four different streams above referred to, so that one sprinkler serves several purposes. The manufacturers state that they will send a sample sprinkler by mail on receipt of \$1.

Forged Thimble Skein Wrench.

Oliver Bros. & Phillips, Pittsburgh, Pa., who are represented in this city by the Henry B. Newhall Company, 105 Chambers street, are making the Forged Thimble Skein Wrench represented in the illustration given herewith. A similar implement has heretofore been made of malleable iron, which was necessarily heavy and bulky. The article now referred to is made of mild steel or ingot iron, and is described as much lighter, stronger and very much cheaper. The cut represents the wrench half size.

New Gauge Ripping Plane.

The Sandusky Tool Company, of Sandusky, Ohio, are asking attention to Kenney's Gauge Ripping Plane, by the use of which thick or thin lumber can be ripped by hand with ease and precision. The engraving shows the general appearance of this tool very satisfactorily. By reference to the same it will be seen that in its general features it resembles a common plane. The gauge by which the position of cut is established is not unlike a T-square in character, and is held in place by a thumb-screw which impinges against the plate. In the center of the plane a small circular tooth cutter is so arranged as to be raised or lowered by the second thumb-screw on top, as the thickness of the lumber requires. The thumb-screw referred to is so constructed in different sections with right and left hand thread as to readily accomplish the adjustment above mentioned. When the tool is pushed over the board to be cut the cutter rotates which prevents its following the grain of the timber. In ripping thick lumber the tool is used on opposite sides of the board. From the engraving it will be seen that the tool is very simple, and that it can be adjusted to any width with ease. The makers direct attention to the statement that, as this is the only gauge-ripping plane in the market, it fills a want that has heretofore had no supply. Two qualities are made, the stock being of beach and apple wood, respectively.

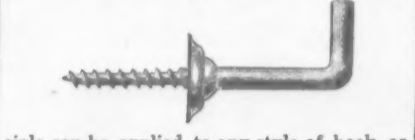
A New Line of Screw Hooks.

An improvement in the manufacture of small Hooks has recently been patented by the Wire Goods Company, of Worcester, Mass., for whom Sise Gibson & Co. are agents, 100 Chambers street, New York. Their improvement consists in upsetting or pressing up a base upon the hook itself for the purpose of giving greater strength to the hook and forming a rest for any kind of ornamental washer or bar that may be desired. It has been the custom heretofore when making a hook of wire or rod to attach an ornamental base by soldering or squeezing it on to the wire hook. With this method, it is intimated, there is a liability of the base working loose and sliding up upon the hook when the last half turn of the screw sends it too snugly home. With this new hook the base or washer cannot become loose, and it is so constructed that it assumes a graceful and yielding shape and becomes a part of the hook when the whole is put together. The cuts below will make the matter plainer. The hook and base are in separate parts, but when put together

they form a solid hook of symmetrical proportions and increased strength. The principle can be applied to any style of hook as follows:



With a similar result:



The patentees announce that they have ceased to make the former styles of braced hooks, and will substitute the improvement on all future orders. They also intend to add largely to the line of small hooks and develop the idea to its full extent.



One of the largest iron mining companies in the State of New York, having, as elsewhere announced, a plant of mining machinery which they desire to utilize profitably, wish to acquire developed mining property. An opportunity is thus offered to a bona fide enterprise.

SCIENTIFIC AND TECHNICAL.

Compressed Air in Glass Manufacture.

According to the *Glass and Pottery Journal* a new process for making pressed glass ware has just been completed by a press manufacturer, and it is at work in a factory a little way down the river. Instead of being operated by a man working a long lever, as in the ordinary press, the motive power of this machine is compressed air. The molds are secured to a revolving plate or table, and, as the press works, each mold is brought in rotation under the plunger.

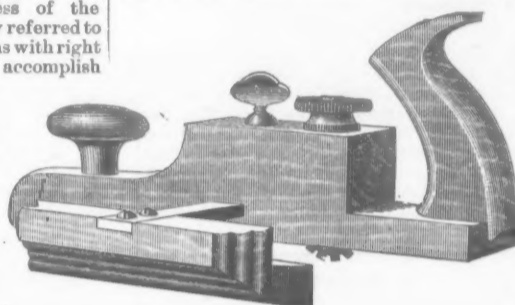


Forged Thimble Skein Wrench.

There are five molds used in this one. It is claimed that from 10 to 20 pieces can be turned out in a minute, according to the skill and dexterity of the attendants, and that it must finally supersede ordinary presses for all purposes. It must be said, on the other hand, that while admitting its value several manufacturers warmly combat the latter proposition and refuse to admit that it is a palpable necessity. There is little doubt, however, that for some kinds of work it is a great improvement on the present system.

A Substitute for Boxwood.

Boxwood has become too costly to be used in the manufacture of loom shuttles, and a good and cheap substitute for it has been found in compressed teak. For subjecting the teak to the necessary pressure a powerful hydraulic press is needed. This press has



Kenney's Gauge Ripping Plane.

a strong cast-iron top and bottom and a steel cylinder with a large ram. In the center of the ram is fitted a smaller ram carrying a rectangular head fitting into a die which is placed on the top of the large ram. After the timber is put into the die a pressure of 14 tons per square inch is applied. The pressure is then relieved and the large ram descends. The top pressure block fitting the die is afterward removed and the small ram rises and pushes the compressed timber out at the top of the die. The timber thus treated is very dense, uniform, and close grained, and is capable of taking a very high finish.

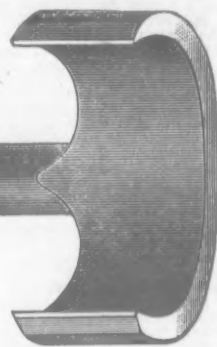
An Improvement in Rock Drills.

During the recent meeting of the Institute of Mining Engineers one of the most interesting excursions was to the Government works at Flood Rock. There Lieutenant Derby, resident engineer, showed an improvement that he had made in rock drills. Instead of the ordinary solid drill, he uses a hollow steel bit attached to a hollow drilling rod by a copper screw ring. This crown bit, which has a serrated edge, is used for cutting the whole length of the hole by changing it from one rod to another. It cuts a circular groove, leaving a core which breaks when it gets an inch or so long, and is then crushed by the next blow. Further, he has applied the principle, long used in the diamond drill, of having a current of water flowing constantly through the drill, carrying away the debris and leaving always a clean surface of rock for the drill to strike on. The water connection is made by a tube passing through the upper end of the cylinder and working as a plunger in the piston. The water pressure required, which is slight, is there easily obtainable, as the workings are all under water and the roof leaks badly in many places. The increase in work done is really remarkable, an advance of 16 feet in one eight-hour shift by the old drill rising to 25 when the new form was substituted. The invention is said to have saved the Government about \$20,000 in the Flood Rock work alone. The only valid objection to the drill seems to be the extra blacksmithing work necessary in making and keeping it in order. A writer in the *School of Mines Quarterly* states that the Messrs. Rand have obtained a controlling interest in the patent for this drill and will soon put it on the market.

The Maurice Fire-Damp Indicator.

If a mixture of air and fire-damp (carbureted hydrogen), and possibly other gases, be introduced into a chamber which is then closed air-tight, and if the chemical composition of the fire-damp within the closed vessel can by any means be so changed or destroyed that the density of the inclosed atmosphere becomes altered, then by the assistance of a suitable gauge the precise extent of this change of density can be measured, and the quantity or percentage of fire-damp in the air operated upon can be determined. The simplest way of changing the chemical composition of fire-damp under the above conditions is to destroy it or burn it out by means of a heated platinum wire. This process results in a reduction of the density of the atmosphere in the closed vessel in which it is carried out. It may be noted that ignited platinum has the property of inducing the slow combustion of carbureted hydrogen gas, the reaction being in no way interfered with by the presence of other gases, which are not affected by the platinum. It is a simple matter to ignite a fine platinum wire, a single small coil of Grove's battery having sufficient power for the purpose. The burning-out process must take place in a perfectly air-tight closed vessel, otherwise it would not be possible to as-

certain the alteration of density of the atmosphere consequent on the removal of the fire-damp. The gauge for measuring the amount of vacuum formed may consist of a glass syphon tube or of an aneroid arranged as a gauge, which might be preferable; in either case the gauge is inclosed in the test vessel, which is observed through



the glass, and its variations read by means of a scale attached to it. Upon these principles rests the construction of the Maurice indicator, described at a recent meeting of the North Staffordshire Institute of Mining and Mechanical Engineers. The instrument consists essentially of a glass cylinder 1½ inches in diameter, closed at each end with vulcanite discs cemented in so as to be impervious to air. This serves as the air chamber, and is fitted inside with a fine platinum wire ¾ inch in length, the ends of which are attached to short conducting wires, terminating on the outside of the vessel in battery connections. In the interior of the air chamber is fixed a glass syphon gauge, partly filled with glycerine, and attached to this is a boxwood scale divided into inches and tenths of inches. The only communication between the inside and outside of the instrument is by means of two holes through the top and bottom of the air chamber. To the exterior of these openings are attached rubber tubes extending respectively to the top and bottom of the instrument. These tubes pass through a small press made of brass which when screwed down effectually closes them, causing the air vessel to become perfectly air-tight. A mouthpiece is fitted to the end of one of the tubes, and when the press is open the air in the air chamber may readily be exhausted by suction, when the air which it is intended to test enters through the other tube and fills the vessel. There are tables with each instrument giving the gauge readings and the percentages of fire-damp from ⅓ of 1 per cent. upward. With such an instrument as described above there is no difficulty in correctly indicating the presence of ⅓ of 1 per cent. of fire-damp.

The Calorific Power of Coal.

There has been quite a heated controversy between MM. Meunier-Dollfus and Scheurer-Kestner and a number of German scientists over the values of the experimental calorific power of coals found by them. One of them has repeated his experiments, choosing Rouchamp coal having the following composition, calculated free from cinder:

	Per cent.
Carbon.....	89.09
Hydrogen.....	5.09
Nitrogen.....	1.3
Sulphur.....	1.03
Oxygen, by difference.....	3.49
Total.....	100

Using the modified Favre and Sitberman apparatus, he obtained the following results: Substance used, dried at 110° Celsius, .4509 grains:

	Calories.
Calorimeter.....	8,572
Carbon not burned.....	346
Carbonic oxide not burned.....	354
Hydrogen not burned.....	43
Total.....	4,115

or per unit of weight 9130 calories. A comparison of this result and of those obtained in 1869 shows:

	1869.	1869.	1884.
Carbon.....	89.09	88.38	89.09
Hydrogen.....	5.09	4.42	5.09
Nitrogen.....	1.25	1.3	1.3
Oxygen and sulphur.....	3.07	6	4.52
Calorific power.....	9107	9117	9130

Thus, the last results obtained lie between those of two different samples in 1869. In the examination of last year's sulphur was for the first time taken into account. M. Scheurer-Kestner's results seem to establish that the calorific power of coal is considerably greater than is generally believed.

The Stockport Gas Engine.—Mr. John S. Long has received from England per

steamship Serbia a 2-horse-power "Stockport" gas engine which will be running at his place of business, 4 Fletcher street, New York, about the 25th inst. The company owning the patents claim that it is in every way superior to any gas engine now on the market, and that in England it is selling more readily and giving better satisfaction than any other. Various improvements in it have been recently secured by letters patent in England, on the Continent and in the United States. The company are manufacturing the engine in England. They have sold rights to manufacture on royalty in the principal countries of the Continent, and now propose making the same arrangement in the United States. The inventor of the machine and a representative of the company will arrive in New York by the steamer Britannic about the 23d inst. The makers have made and sold more than 2000 gas engines, ranging from 1 to 4 man-power. They therefore claim an extensive experience in motors of this class, and the "Stockport" large-power gas engine, being the outcome of that experience, has been designed specially to meet the constant and increasing demand from their customers for engines of greater power than they have hitherto manufactured. In this engine the piston receives an impulse for every revolution of the crank. This, together with a novel and patented mode of governing the explosive charges, is said to insure greater steadiness of speed under fluctuating loads than has previously been attained in the gas engine.

Foreign Markets.

FRANCE.

Paris, April 30, 1885.—Metals.—The less threatening political aspect of the prospects in France have exercised some improvement in business, and a revival is noticeable in most branches, including Metals. The latter have enjoyed a steady demand with great firmness in all but Spelter, which is slightly lower. We quote at the close: Copper, Chili Bars, 113.75 @ 117.50; Ingots and Slabs, 122.50; Best Selected, 126.75; and Pure Corocoro Ore, 117.50. Tin.—Banca, 225.50; Billiton, 217.50; Straits, 215; Australian, 215; English, 215; Lead, 36.75 @ 37.75; and Spelter, 36.75 @ 37.50. Iron.—Sales all over France have been on the increase during the week, but without improving prices in the least, there is, however, much confidence expressed in the future; public works, both Government and private, will be carried on on an increased scale this year, and as prices of Iron and Steel are lower than they were at any previous time, an unusually large consumption is in prospect. Iron production in France in 1884 has been 1,497,953 tons of Puddling Pig and 397,835 tons of Foundry do.; together, 1,895,787; Iron Rails, 15,653 tons; Merchant Iron, 793,679 and Sheets, 128,492; together, 922,171 tons; Steel Rails, 371,432 tons; Bar Steel, 88,181, and Sheets, 80,933; together, 169,114. In this city, despite a good building demand, Merchant Iron continues selling at 18.50 @ 14, and Flooring do., at 14. Advances from Saint Didier are favorable, the demand for vineyard Fence Wire is pressing, and all works are busy; stocks are exhausted. The quotation there is 14.50 @ 15 for Coke Iron, and 16 @ 16.50 for Mixed. Coal moderately active and sustained.—*Moniteur des Interêts Matériels.*

BELGIUM.

BRUSSELS, April 29, 1885.—Iron.—At Charleroi the week has been less active, there being a falling off in the export demand. On our own exchange there has been unusual animation and considerable inquiry from consumers, who are now willing to contract for future delivery, taking as they do a more cheerful view of the Belgian Iron trade during the coming summer months. There is indeed a better feeling, based chiefly upon a somewhat improved outlook in France and England. Work is furthermore projected on various branch lines in this country, and unless we are greatly mistaken, we are on the eve of a revival. Meanwhile, though not higher, our market is firm and may be quoted as follows: English Pig, 4.35 francs @ 100 kg; Lux embourg, 5; Charleroi, 4.75; Puddling Pig, 4 @ 4.80; Luxembourg, 4.40; Merchant No. 1 for export, 10.75; do. for home consumption, 11.25; No. 2, 11.75; No. 3, 12.50; Beams, 11.75 @ 12.25; Angles, 12.25 @ 12.75; do. for steamers, 13.25; Sheets for export, No. 1, 14; do. for home use, 14.25; No. 2, 13.25; Commercial, 30.25; Thin, 22.25; and No. 4, 21.25. Coal has remained unaltered, with a moderate trade.—*Moniteur Industriel.*

GERMANY.

BERLIN, April 25, 1885.—Petroleum.—The annual report of the Russo-German Naptha Import Company for 1884 has just been published, from which it appears that the gross profit has been 72,284 marks, and the net profit 32,196 marks, from which a 7 1/2 dividend was declared on 800,000 marks, the payment made by shareholders on 1,500,000 marks shares. The company sold in 1884, altogether, 138,547 cwt. of Naptha products, worth 880,904 marks. Against deterioration of real estate, Cistern Wagons, &c. worth 300,896 marks, there were set aside from the profit 20,088 marks. The decline of 2 1/2 in American Petroleum caused a proportionate one in Russian, hence the year was less prosperous than had been expected. Nearly all that was imported in Nobel Tank cars was sold in Eastern Prussia and the Province and Kingdom of Saxony. Unless the German railroads reduce freights, now twice what they are in Russia, the company will have to make use of Tank steamers.—*Borsen-Courier.*

HAMBURG, April 30, 1885.—Iron.—The German Iron market has shown little animation during the week; the position of Pig Iron in Upper Silesia in particular has got to be worse. As long as there was an export of Pig to Russia and a regular demand from rolling mills the output of the blast furnaces then in operation was easily absorbed, but the price insisted upon was so high, comparatively speaking, that the chief rolling mills resolved to build furnaces of their own and thus become independent. While Merchant Iron only brought 110 marks, Puddling Pig commanded 57. Now the high duties in Russia put a stop to the export trade, and there is over-production and no outlet; the consequence is a decline to 51. Foundry Pig, on the other hand, sells well and easily, foundries being very active just now. There has been a rather better demand in that district for rolling-mill products. Rod Iron in particular. Business is far from satisfactory in Rhenish Westphalia, so that it is seriously contemplated to form a combination of rolling-mill owners. All Pig and Merchant Iron is dragging, the only demand noticeable being for Structural and for Boiler Sheets. Dortmund quotes Spiegel 48 @ 50 marks @ ton; White Pig, No. 1, 46 @ 47; Thomas, 43 @ 45; Siegen-Nassau, 44 @ 46; Luxembourg, 35; Foundry Pig, German, 53 @ 55; Spanish, Mudeja, at Ruhrort, 60 @ 70; English, No. 3, there, 43; Spanish Bessemer, at Rotterdam, 50 @ 51; German Bessemer, 47 @ 48; Merchant Iron, 107 @ 130; Sheets, 115 and Rolled Wire, 118 @ 115. Metals.—Copper has been weak. Lead looking up. We quote at the close: Copper, Lake Superior, 53 @ 56; German Lead, 11 @ 12; Spelter, 14.80 @ 16, and Tin, 85 @ 84 marks @ 50 kg.—*Borsenhalles.*

HOLLAND.

ROTTERDAM, April 25, 1885.—Tin.—Has been quiet, both Banca, spot, and Billiton. May sale, have been freely offered and as readily taken at a slight decline. Very little has transpired in distant futures. We quote Banca, spot, 48.25 guilders @ 50 kg; Billiton, do., 48, and 48.75 August delivery.—*Koch & Vletterboom.*

SPAIN.

HUELVA, ANDALUSIA, April 26, 1885.—Copper.—At the general meeting of Rio Tinto shareholders, to be held on May 5 next, a final dividend of 6/ per share is to be declared, which, together with the November dividend, will make 8 1/2 per annum, and after paying the same they are referred to the new account £20,112. In 1883 the dividend was 28/ per share. The amount of money in bank diminished last year 1,072,854 pesetas, or francs. The main expenditure was for wages and buildings in Marcellas, 489,545; for materials and tools there, 422,668; general expenses and dues, 108,954; payment of coupons No. 1, 203,297. On the other hand the company collected 173,593 pesetas for interest due. The company had cash and in bank on December 31, 1884, altogether, 5,376,885 pesetas, and outstandings amounting to only 3145 pesetas.—*Revista Minera.*

AUSTRIA.

VIENNA, April 26, 1885.—Iron.—The only thing of interest that occurred during the week was the burning of the important Döbroyer Iron Works in Hungary. Meanwhile, the Iron trade has continued dull, there has been no spring campaign, and prices are weaker than ever. We quote toward the close: White Pig, 47 @ 48; Gray do., 58 @ 54; Bessemer, 54 @ 55; Styrian Merchant, 125 @ 130; Bohemian, 105 @ 110; Sheets for lock-smiths, 100 @ 170; do. for Roofing, 180 @ 190; do. for Boilers, 170 @ 185; do. for Tanks, 170 @ 175, and Beams, 105 @ 115 florins @ ton, at Vienna.—*Austrian Trade Journal.*

EAST INDIES.

SINGAPORE, March 22, 1885.—Tin.—Tin has been quiet, 75 tons selling at \$35.75 @ picul, and 25 at \$35.50. At the close there are sellers at \$35.25. There were exported to the United States during the first two months 5465 piculs, against 9441 in 1884; 29,463 in 1883, 24,432 in 1882, 3330 in 1881 and 45,090 in 1880. Exchange, four months' bank, 3/7 1/4.—*Gülden, Wood & Co.*

PERANG, March 24, 1885.—Tin.—Laroot Tin opened at \$35.40, but subsequently receding to \$35.25. Later on the market recovered to \$35.55, but under weak cable news wound up at \$35.45. Fortnight's receipts were 6000 piculs and the sales 7000, but very little being taken for China. Total shipments up to the 14th inst., 35,439 piculs to London, 207 to the Continent, and 2993 to the United States. Exchange weak at 3/7 1/4 for four months' bank.—*Schmidt, Kustermann & Co.*

The Wampum Co-operative Wire Company, of Wampum, Pa., have just completed their new works, and expect to begin operations in earnest, running double turn, this week. A run of several tons of wire was

made on last Friday with the most satisfactory results. The capacity for the present will be about 25 tons a day. Sufficient orders are already on the books to keep the mill running double turn for at least 10 months. The dimensions of the main building are 100 feet square, with cleaning and annealing houses of 50 feet square each. The wire drawers are all skilled workmen and are also stockholders; 75 to 100 workmen will be employed when running full. The Lake Erie and Erie and Pittsburgh railroads will, in the near future, run side tracks to the new mill. Several well-known capitalists are interested in the new enterprise in conjunction with the skilled labor. The officers are J. H. Snedden, chairman; Dr. M. H. Dean, treasurer, and William Kelvey, secretary. Directors: W. Rohrcast, H. A. Thompson, Dr. M. H. Dean, J. H. Snedden and William Kelvey.

Large Mine Pumping Engines.—One of the largest pumping engines in the Birmingham district, England, for draining the submerged mines was started recently at Prince's End at the Moat Colliery. The engine, which was supplied by Messrs. Hathorn, Davey & Co., of Leeds, is a horizontal one, with 10-foot stroke. The pumps have two 19-inch plungers, with 10-foot stroke, placed at a depth of 464 feet. The bottom lifts which face the plungers are 156 feet long. At each stroke of the plungers 245 gallons of water are brought to the surface, and the engine will raise 2,000,000 gallons of water per day. Messrs. Hawksley & Co., of Sheffield, have supplied three Lancashire boilers, 30 x 7 feet. The engine will displace with six smaller engines and will drain several miles of mineral area submerged for years. The cost of the engine and works carried out by the Mines Drainage Commissioners is about £14,000.

On May 9 Judge Spear appointed Edwin Bell and E. L. Wilder receivers of Arms, Bell & Co., owning the Nut and Bolt Works and the Grasshopper Rolling Mill, Youngstown, Ohio. The works have been in dispute among the stockholders for some time. The receivers are said to be mutually agreed upon and will at once start all the works, which employ about 300 hands. They have been idle some months.

CONTENTS.

	PAGE.
The Iron Ores of Elba.....	1
Edward Frith. Illustrated.....	1
Open-Hearth Steel in Great Britain.....	1
A Standard Method of Steam-Bolter Trials.....	5
New Publications:	
Art and Decoration.....	7
Watch and Clock-Making.....	7
Steam Using or Steam-Engine Practice.....	7
Latest Legal Decisions.....	9
A Share Certificate of the Original Liverpool and Manchester Railway.....	9
Exhaust Steam for Heating.....	9
Hardening Steel by Pressure. Illustrated.....	11
English Letter.....	13
Editorial:	
The Labor Situation in the West.....	16
The English Bessemer Steel Industry.....	16
Railroad Bridge Inspection.....	16
Spanish Copper Companies.....	16
Condition of the Anthracite and Bituminous Furnaces May 1, 1885.....	16
Washington News.....	17
Obituary:	
William Brown.....	17
The New Sliding Scale in Iron Mining in the North of England.....	17
Condition of the Anthracite and Bituminous Furnaces of the United States, May 1, 1885.....	17
Metallurgical Notes:	
Sulphur Crystals on Blast-Furnace Cinder.....	17
Plant and Processes.....	17
Information on Labor.....	17
The Week.....	18
The Iron Age Directory.....	19
Trade Report:	
British Iron and Metal Markets.....	21
Financial.....	21
Metal Market.....	21
Metal Exchange.....	21
New York Iron Market.....	22
Philadelphia.....	22
Pittsburgh.....	22
Chicago.....	22
Chattanooga.....	23
Cincinnati.....	23
Louisville.....	23
Imports and Exports.....	23
Coal Market.....	23
General Hardware.....	24
Labor Troubles at the Scranton Steel Works.....	24
The Cost of Unloading and Loading Freight.....	25
List of Steam and Gas Fitters' Brass and Iron Work.....	27
Industrial Items.....	27
Current Hardware Prices.....	28
Wholesale Metal Prices.....	30
Hardware Novelties:	
Rotary Marking Gauge. Illustrated.....	31
Farmers' Steel Plow Anvil. Illustrated.....	31
The Smith Suspension Carriage-Wheel. Illustrated.....	31
The Jungbluth Lawn and Street Sprinkler. Illustrated.....	31
Forged Thimble Skein Wrench. Illustrated.....	31
New Gauge Ripping Plane. Illustrated.....	31
A New Line of Screw Hooks. Illustrated.....	31
Scientific and Technical:	
Compressed Air in Glass Manufacture.....	31
A Substitute for Boxwood.....	31
An Improvement in Rock Drills.....	31
The Maurice Fire-Damp Indicator.....	31
The Caloric Power of Coal.....	31
The Stockport Gas Engine.....	31
Foreign Markets.....	32
Large Mine Pumping Engines.....	32
Double Facing Machine. Illustrated.....	33
Mother-of-Pearl in Tahiti.....	33
Philadelphia and Pittsburgh Hardware and Metal Prices.....	43
Boston Hardware and Metal Prices.....	44

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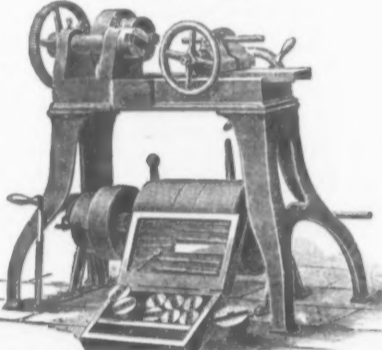
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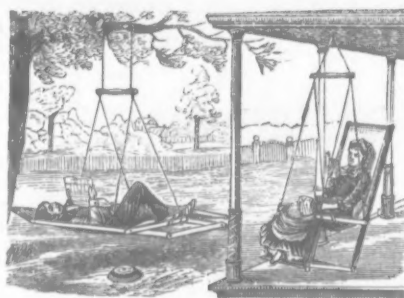
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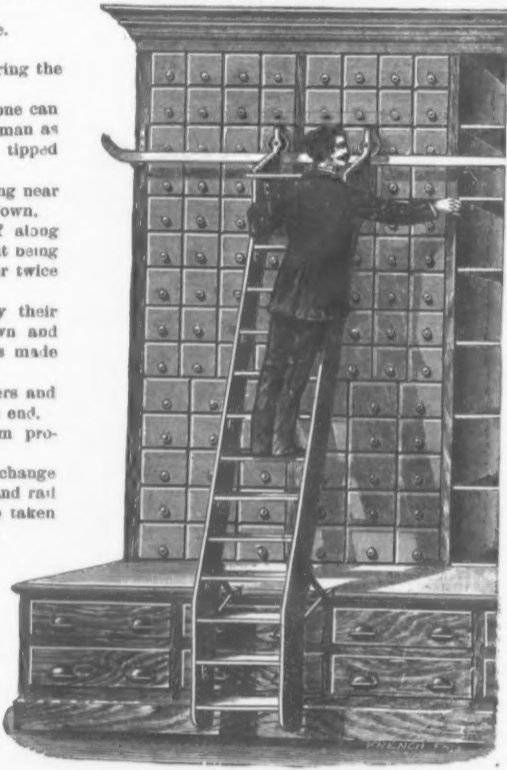
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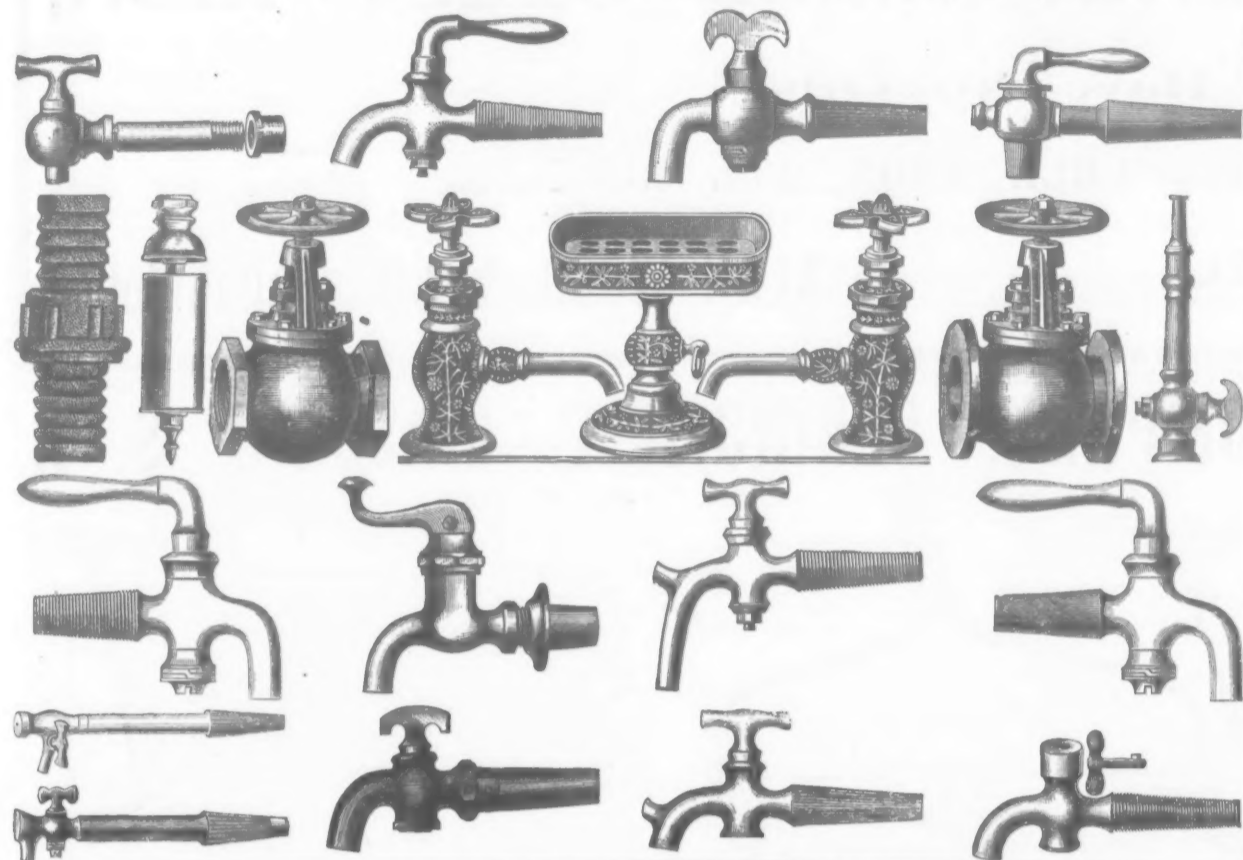
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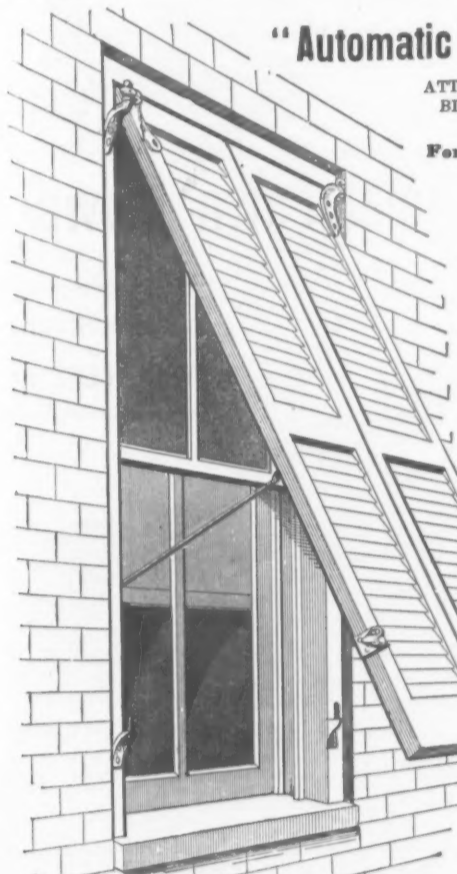
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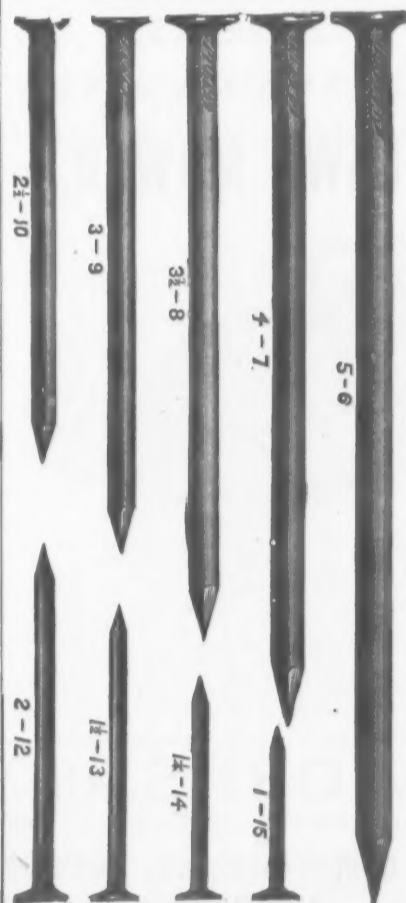
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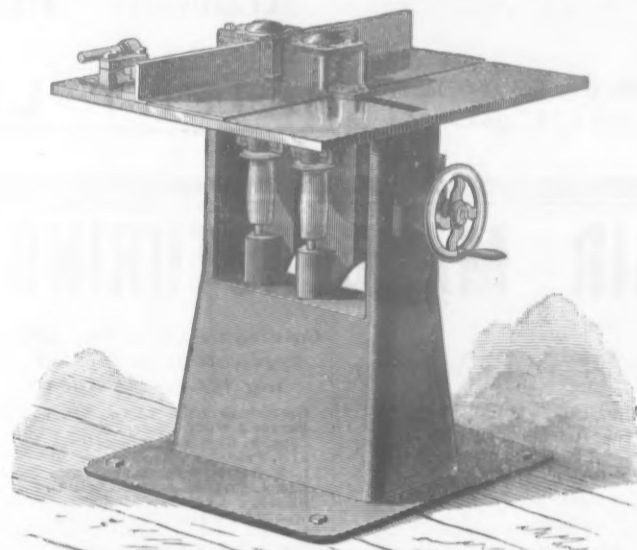
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it is their only industry, and women and even children take part in it. There is at Anaa, says the writer, a woman who will go down 25 fathoms and remain under water for 3 minutes. Nor was she an exception. The dangers of the work are great, for the depths of the lagoons are infested by sharks, against which the divers, being unable to escape, are forced to wage battle, in which life is the stake. No year passes without some disaster from sharks, and when one happens all the divers are seized with terror, and the fishing is stopped for a time. But gradually the imperious wants of life drive them back to the sea again, for mother-of-pearl is the current coin of the Tuamotu. With it he buys the rags which cover him, the little bread and flour which complete his food, and alcohol, "that fatal present of civilization," for which he exhibits a pronounced passion.

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to makers of cigar-boxes and other articles of a similar description. Special attention is directed to the statement that it is a very rapid-working machine.

Mother-of-Pearl in Tahiti.

A recent issue of the *Journal Officiel* contains a lengthy report by M. Bouchon-Brandely, secretary of the College of France, who was sent by the Ministry of Marine and the Colonies on a mission to Tahiti to study questions relating to oyster culture there. The principal product of what M. Brandely, with "the summer isles of Eden" fresh in his mind, calls "*notre belle et si pittoresque colonie de Tahiti*," is mother-of-pearl. All its trade is due solely to this article, which for a century has regularly attracted vessels to the islands which compose the archipelagoes of Tuamotu, Gambier and Tubuai.

The mother-of-pearl which is employed in industry, and especially in French industry, is furnished by various kinds of shells, the most estimated, variegated and beautiful of which are those of the pearl oyster. There are two kinds of pearl oysters—one known under the name of "pintadine" is found in China, India, the Red Sea, the Comoro Islands, Northeastern Australia, the Gulf of Mexico, and especially in the Tuamotu and Gambier archipelagoes; the other, more commonly called the pearl oyster, comes from India, the China seas, the Antilles, the Red Sea and Northern Australia. The shell of the former is harder, more tinted, more transparent and reaches greater dimensions than the latter. Some have been found which have measured 30 cm. in diameter and weighed more than 10 kg., while the pearl oyster rarely exceeds 10 cm. at the most, and never weighs as much as 150 grams. Both varieties supply pearls, those of one kind being at one time more favored, at another time those of the other. This depends on fashion, but, on the whole, those found in the great pintadine are more beautiful and the color more transparent than those of its congener.

The amount of the trade from Tahiti in pearls cannot be stated with accuracy as, there is much clandestine traffic, but M. Brandely puts it down approximately at 300,000 francs, England, Germany and the United States being the chief markets for the fine pearls. The great pintadine is found in great abundance in the Tuamotu and Gambier islands. The situation there is very favorable to them; in the clear and limpid waters of the lagoons they have full freedom for development and are undisturbed by storms. Mother-of-pearl is found in almost every one of the 80 islands which form the archipelagoes Tuamotu and Gambier. These belong to France, having been annexed at the same time as Tahiti and Moorea, and have a population of about 5000 people, all belonging to the Maori race. M. Brandely gives an interesting description of these little-known islands and people. The latter appear to hover always on the brink of starvation, as the islands, which are composed mainly of coral sand, produce hardly anything of a vegetable nature. While the neighboring Society Islanders have everything without labor and in abundance, the unfortunate inhabitant of Tuamotu is forced to support existence with cocoa nuts—almost the only fruit trees which will grow on the sandy beach—with fish and shell-fish which are poisonous for several months of the year, and often they have to kill their dogs for want of other animal food. There are no birds, except the usual sea birds; no quadrupeds, except those brought by man; no food resources necessary to European life, except what are brought by ships. Although the people are gentle and hospitable, they practice cannibalism, and M. Brandely suggests that it is pitiless hunger alone which has driven them into this horrible custom. These miserable people are the chief pearl divers of the Pacific; indeed

For a valueless piece of cloth, a few handfuls of flour or some rum the trader got half a ton of mother-of-pearl worth 1000 or 2000 francs, or even fine pearls of which the natives did not know the value. The archipelagoes were frequented by vessels of all nationalities; mother-of-pearl was abundant, and pearls were less rare than they are now. The number of trading-ships increased; there was competition among them, and consequently a higher price to the natives, who fished to meet the new demand with improvident ardor. The consequence is that the lagoons are less productive, and that even the most fertile give manifest signs of exhaustion. The prospect of having the inhabitants of Tuamotu thrown on its hands in a state of helpless destitution, as well as of the disappearance of the principal article of the trade of Tahiti, and an important source of revenue to the colony, alarmed the colonial administration, and the Ministry of Marine and the Colonies in Paris. Accordingly, M. Brandely was selected to study the whole subject on the spot. The points to which he was instructed to direct especial attention were, first, the actual state of the lagoons which produce oysters; are they beginning to be impoverished, and, if so, what is the cause, and what the remedy? Second, would it be possible to create at Tuamotu, Gambier, Tahiti and Moorea, for the cultivation of mother-of-pearl, an industry analogous to that existing in France for edible oysters? Would it be possible by this means to supply the natives of Tuamotu with continuous, fixed, remunerative labor which would render them independent, and remove them from the shameful cupidity of the traders? Could they not be spared the hardships and dangers resulting from the continued practice of diving, and be turned to more fixed sedentary modes of life, by which they might be raised gradually in the social scale? Third, should the pearl fishing in the archipelagoes be regulated, and, if so, what should be the bases of such regulations?

It was on the mixed economical and phil. anthropic mission here indicated that M. Brandely went to Tahiti in February last. The statistics did not show any decline in the production of mother-of-pearl, but a careful study on the spot showed that this was due to the great amount of the clandestine traffic, and that the lagoons were growing less productive day by day, that beautiful mother-of-pearl was becoming rarer, and in order nowadays to get oysters of a marketable size the divers are forced to go to ever greater depths. M. Brandely recommends prompt and vigorous measures be taken at once, as the lagoons of Tuamotu will soon be ruined forever. The partial steps already adopted have been useless. The total prohibition of fishing in some of the islands for several years has failed, because it has been found that the pintadine is hermaphrodite, and not, as formerly was believed, unisexual. The cause of the impoverishment of the lagoons is excessive fishing, and nothing else. He thinks that it is possible to create in Tuamotu, Gambier, Tahiti and Moorea a rational and methodical cultivation of mother-of-pearl oysters, analogous to that existing with regard to edible oysters on the French coasts, and to constitute for the profit of the colony an industrial monopoly which no other country can dispute, for nowhere else can such favorable conditions be met with.

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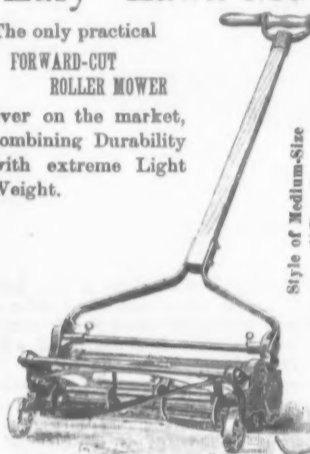
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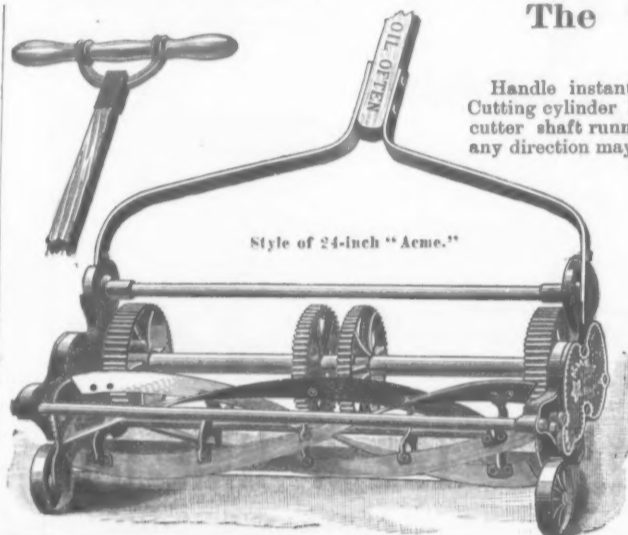
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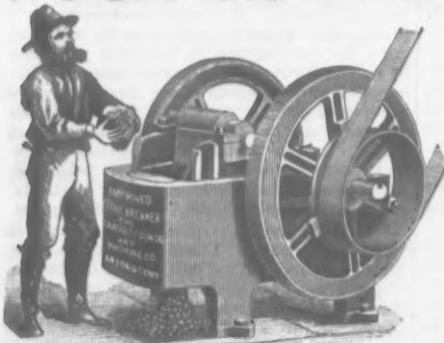
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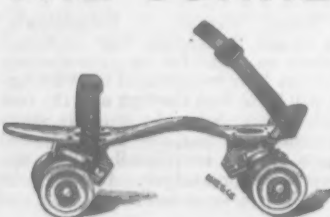
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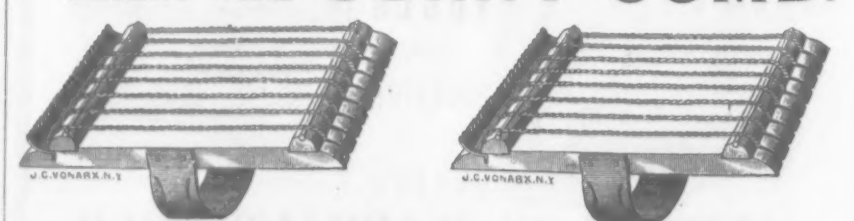
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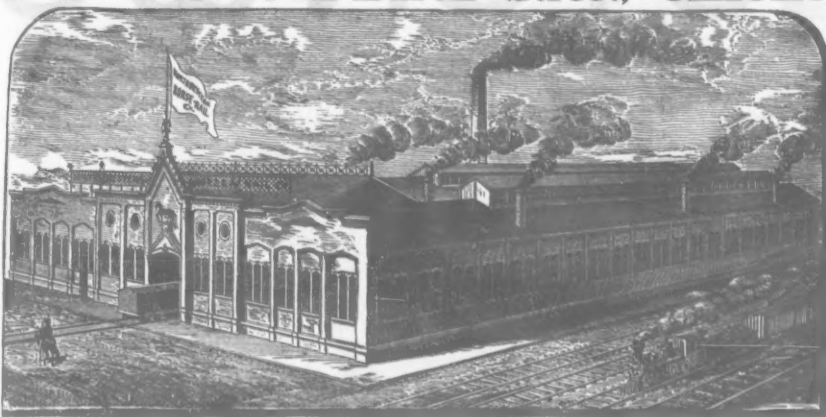
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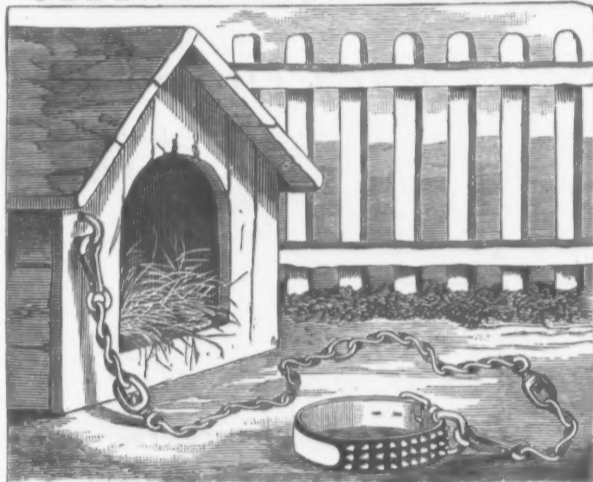
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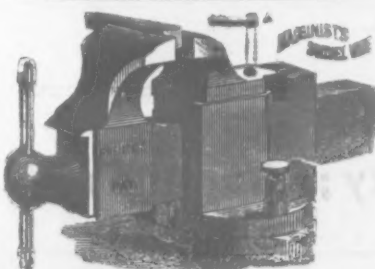
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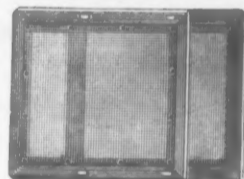
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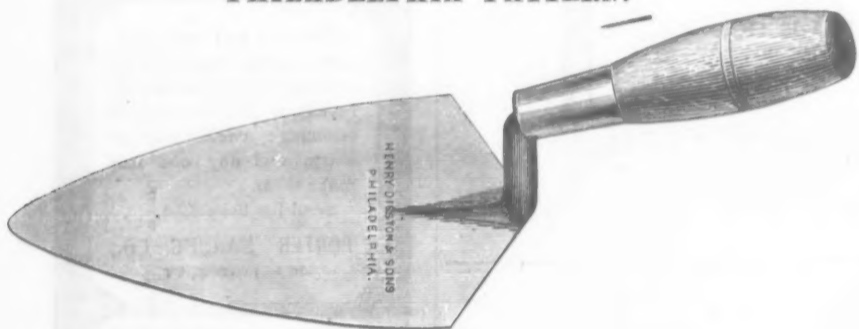
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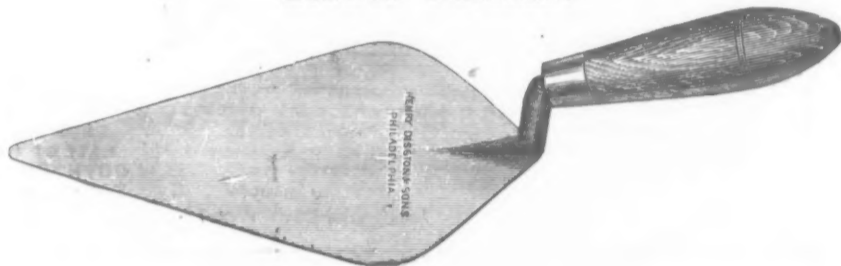
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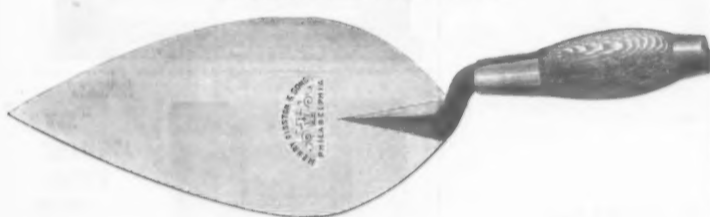
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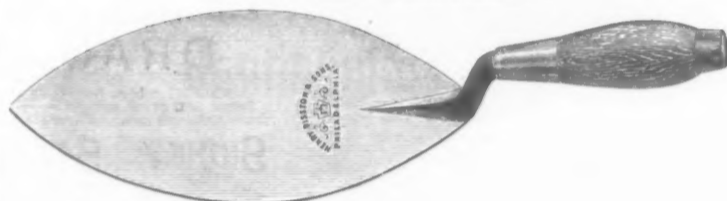
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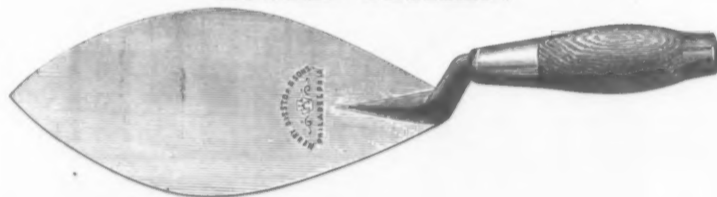
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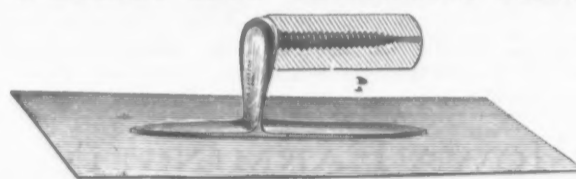
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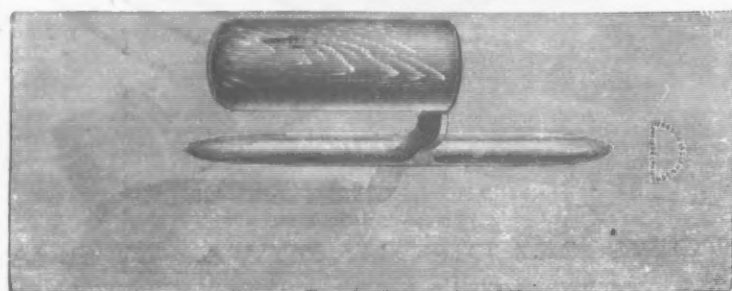
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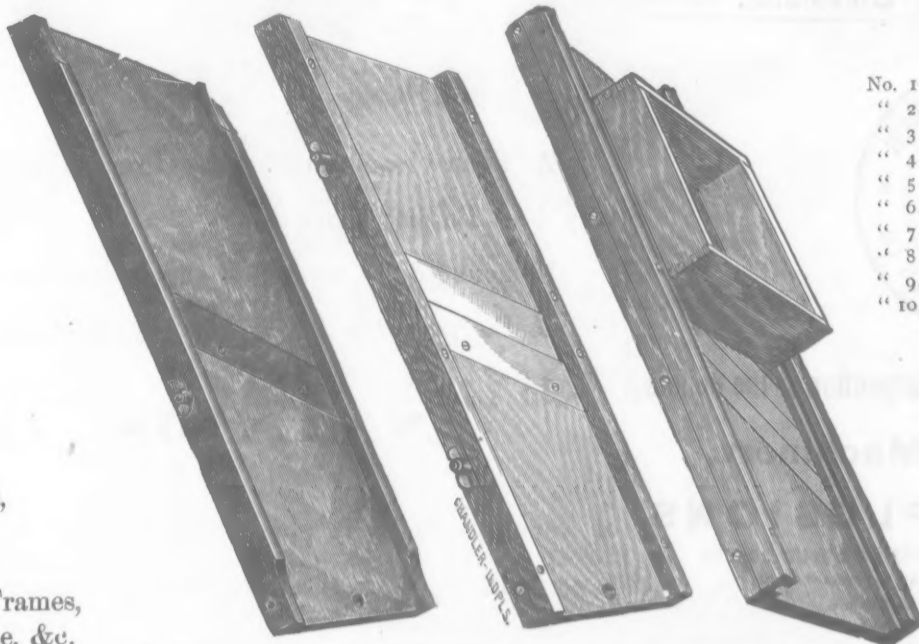
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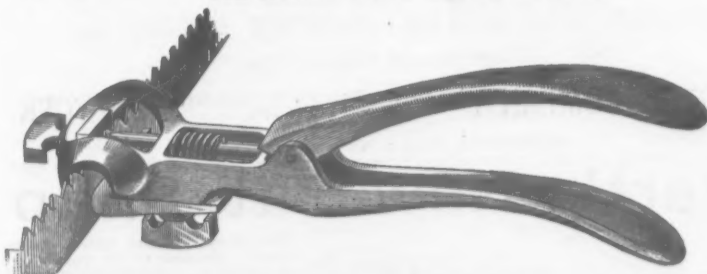
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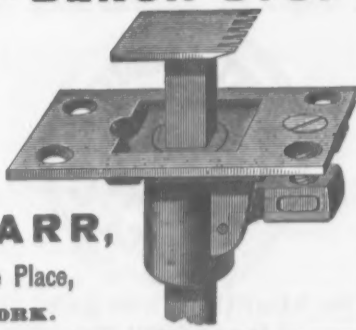
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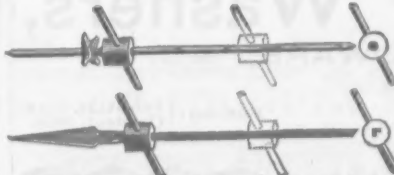


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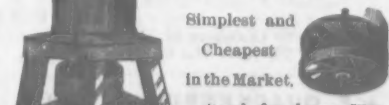
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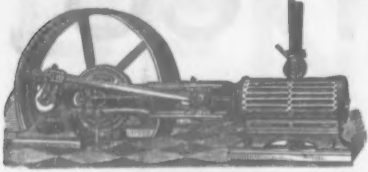
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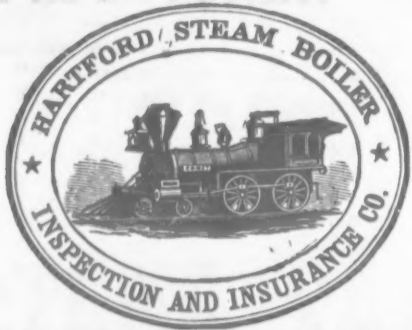
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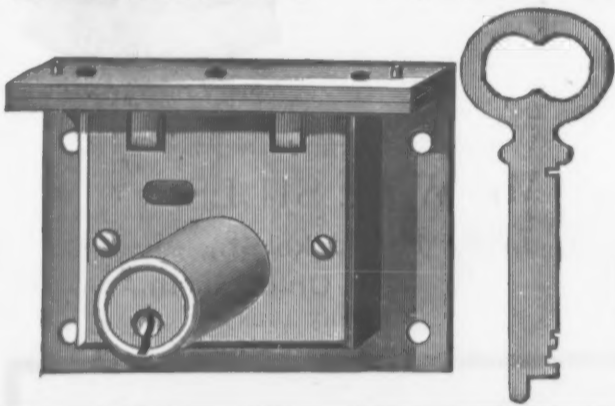
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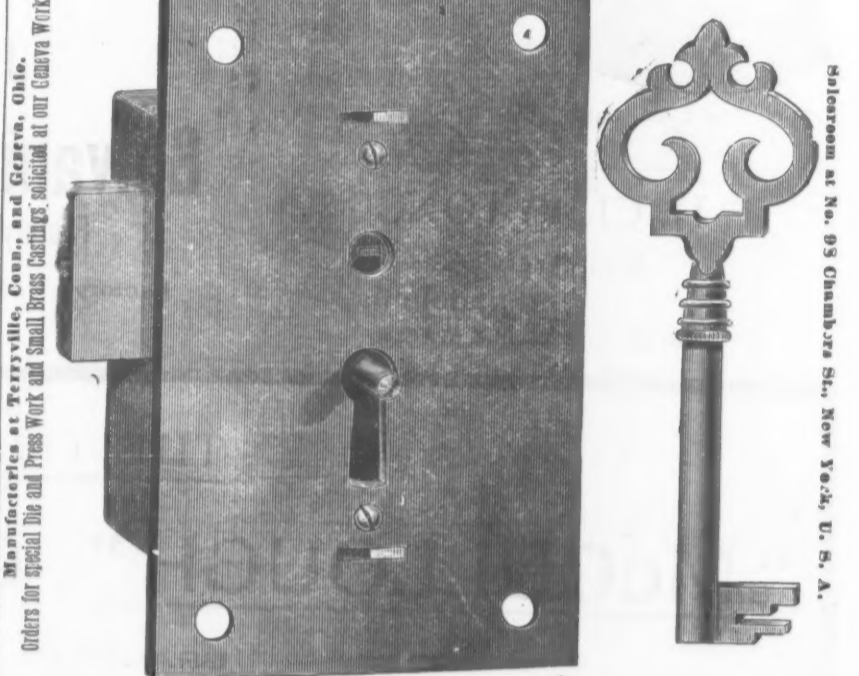
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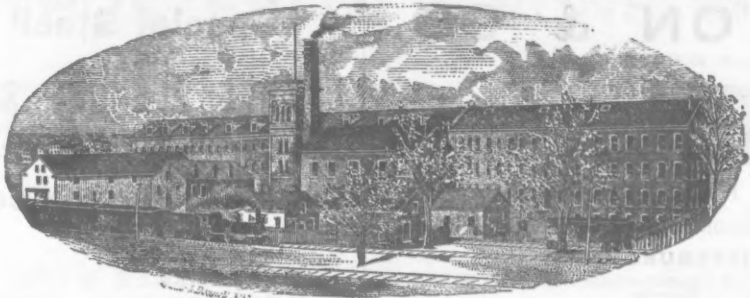
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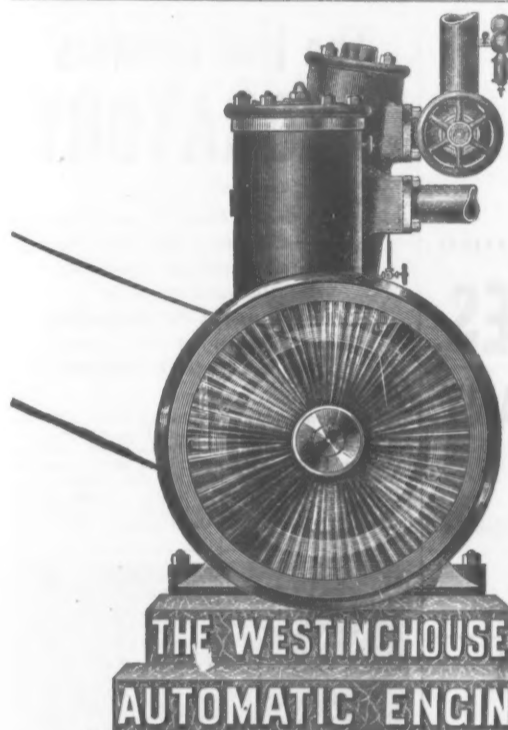
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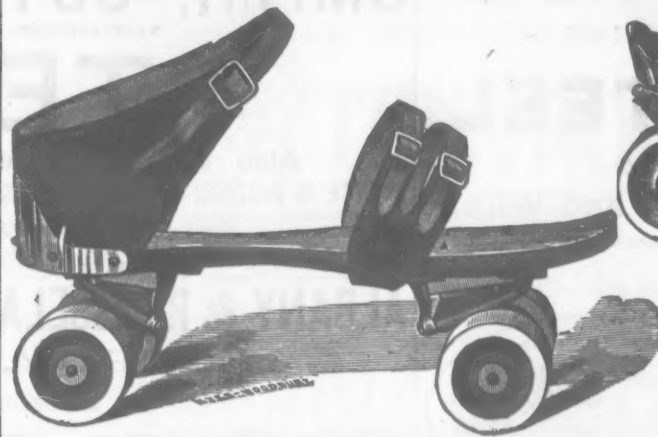


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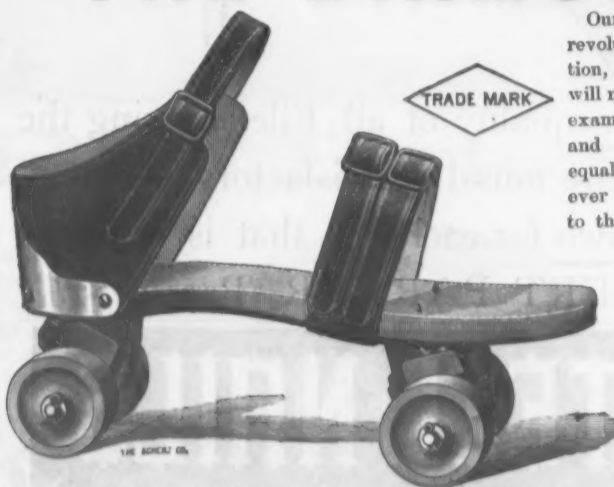
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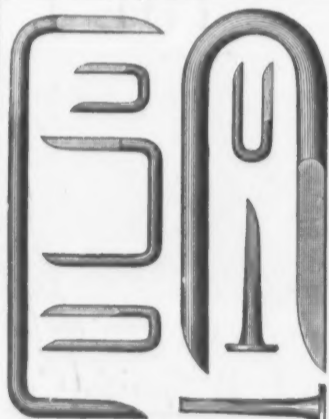
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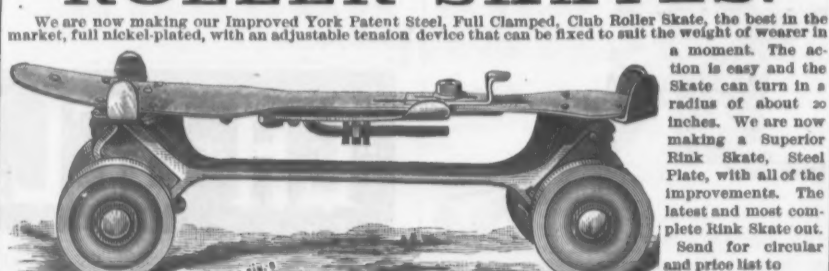
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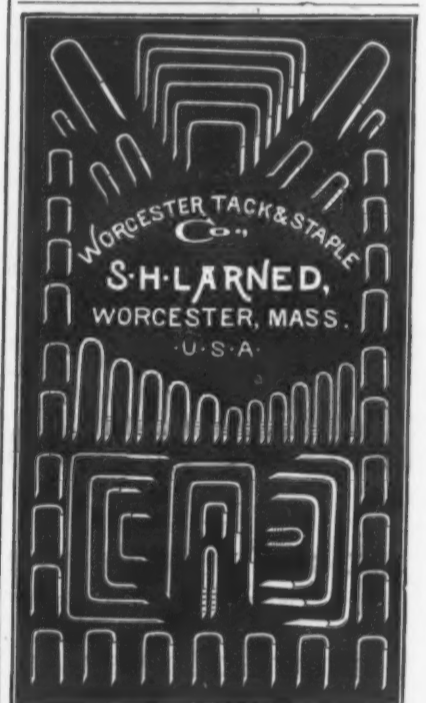
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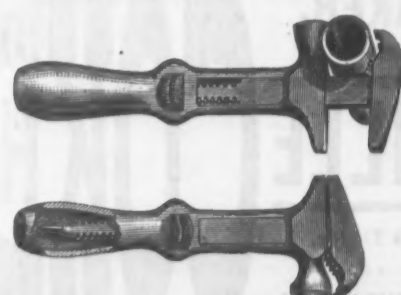
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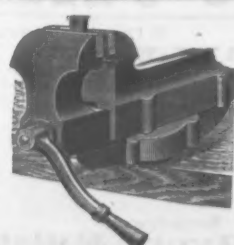


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ESTABLISHED IN 1859.



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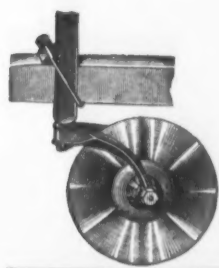
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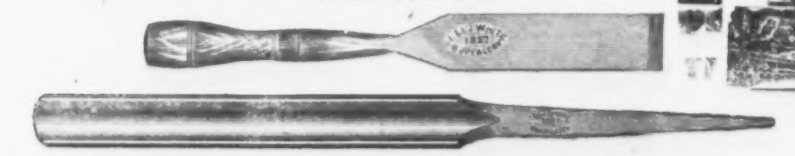
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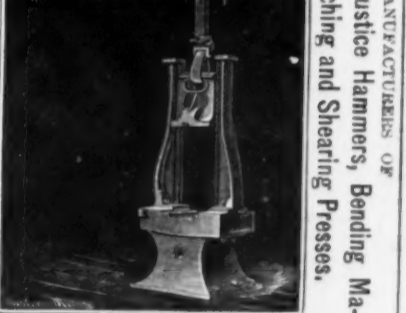
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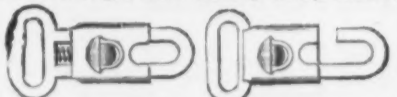
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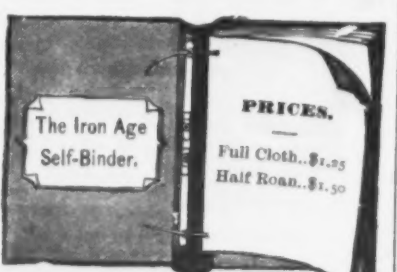
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These "Chinese" Laundry Irons are of
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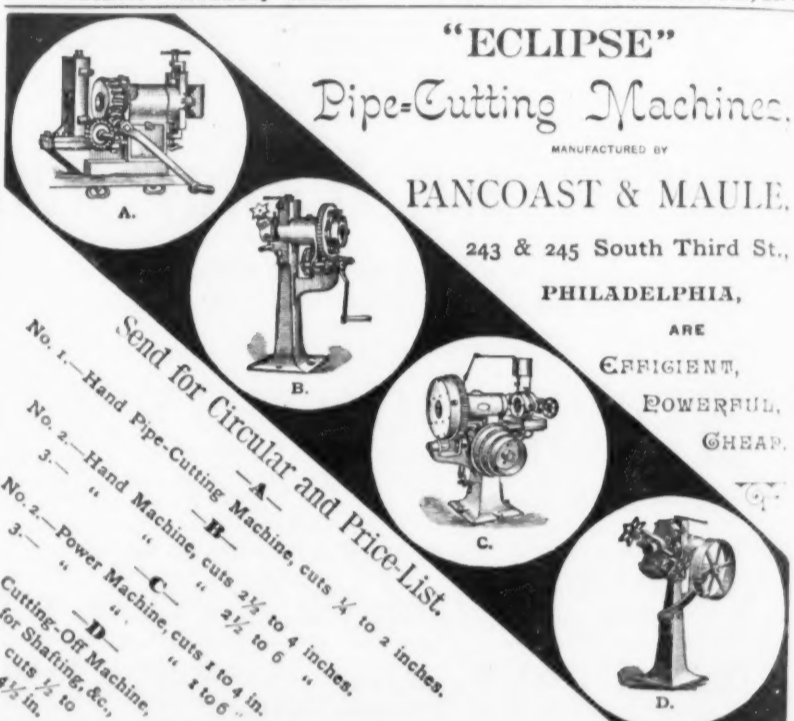
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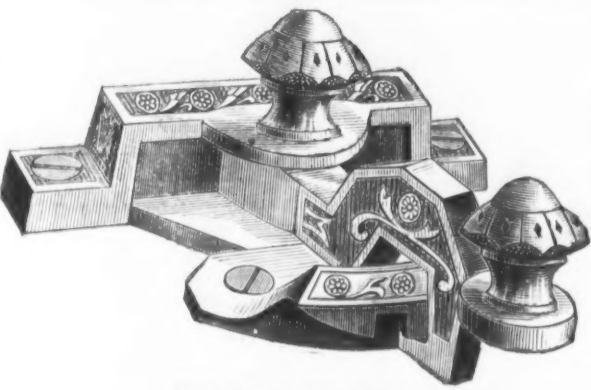
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Full Size.—No. 205.

Ornamental. Real Bronze, with Bronze Screws. Very Heavy. Our last Design.
PER DOZEN, \$3.36.

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MANUFACTURERS OF

LOCKS Of Every Description,

AND A FULL LINE OF
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Fine Gray Iron Castings of every description, also Real Bronze and Brass Castings, made to order at very low prices; Pattern Making, Japanning, Bronzing, Tinning, &c.
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MANUFACTURED BY
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Steel Door Hangers

FOR EVERY PURPOSE.

Anti-friction Steel Barn Door Hangers.
Three sizes of Steel Common Hangers.
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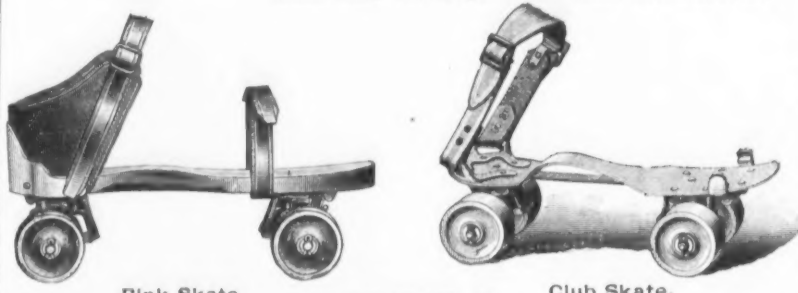
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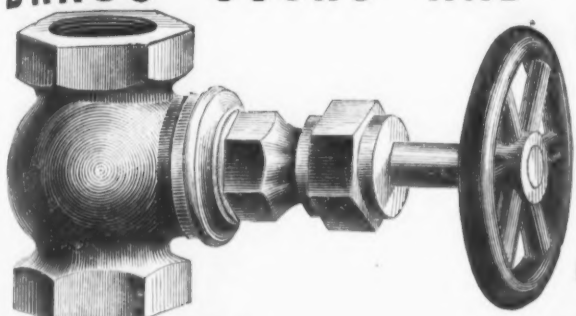
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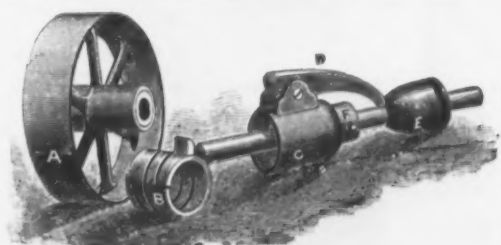
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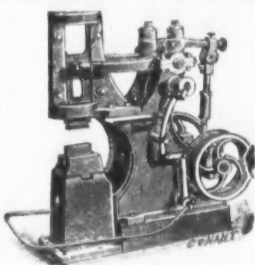


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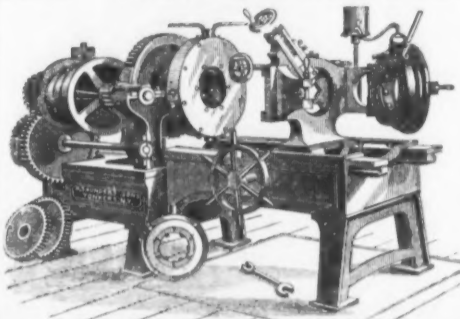
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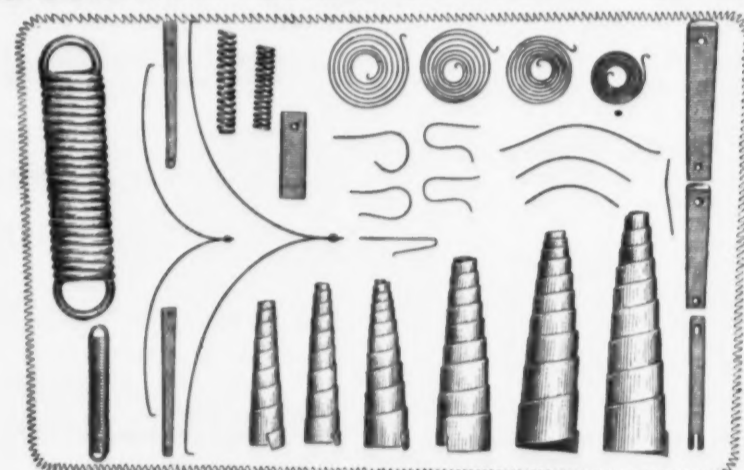
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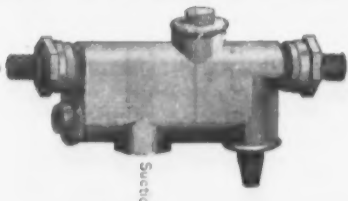
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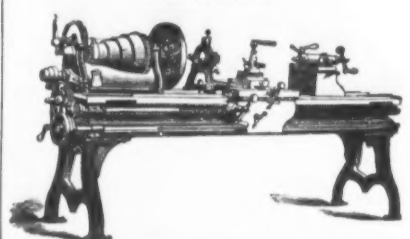
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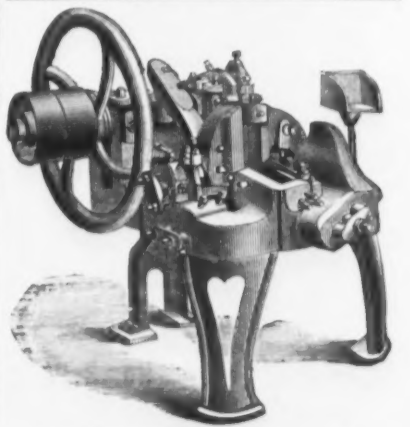
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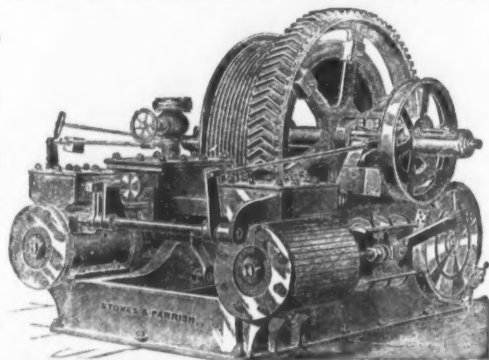
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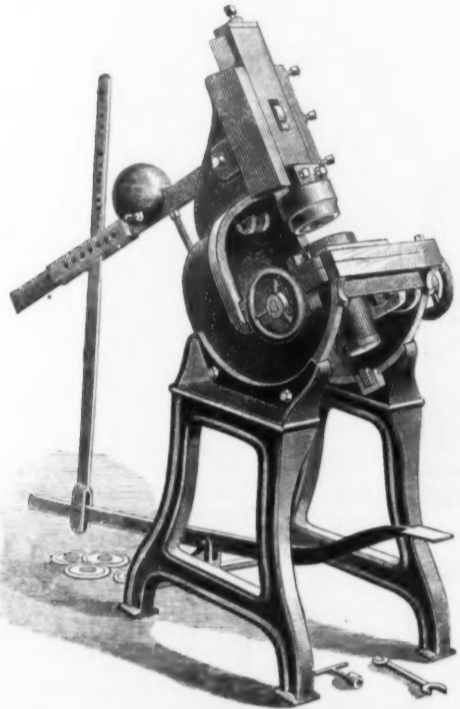
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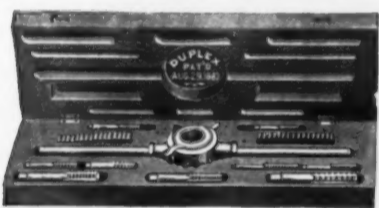
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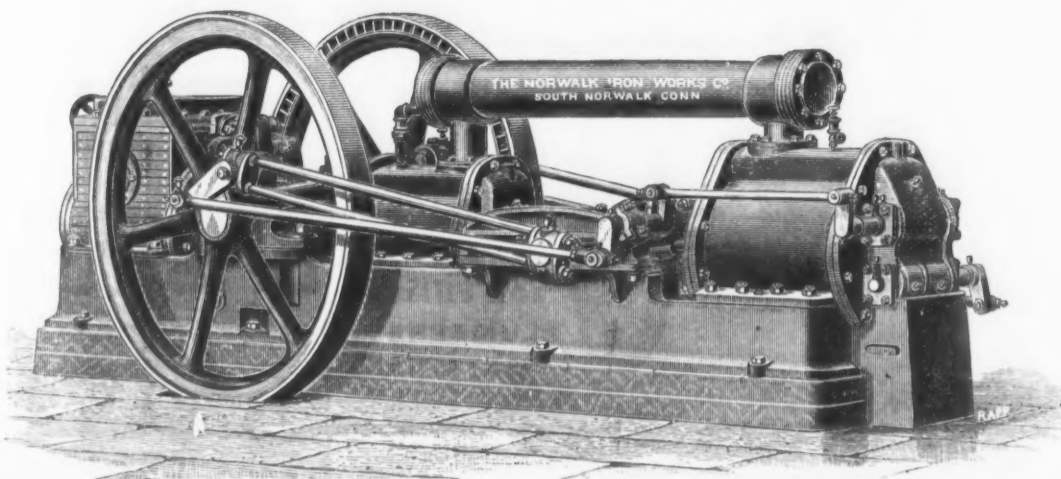
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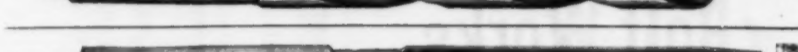
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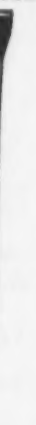
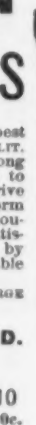
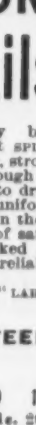
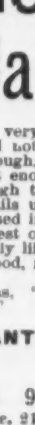
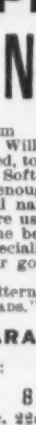
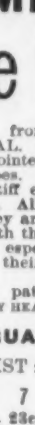
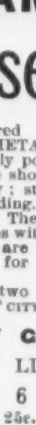
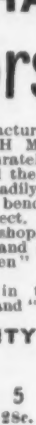
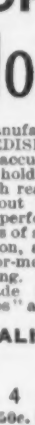
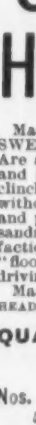
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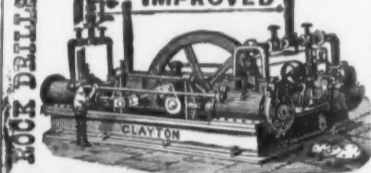
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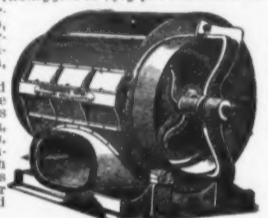
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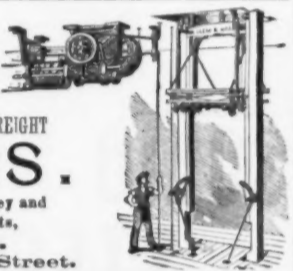
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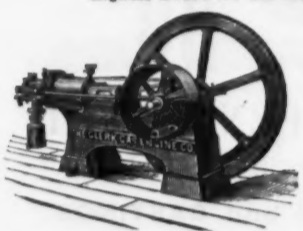
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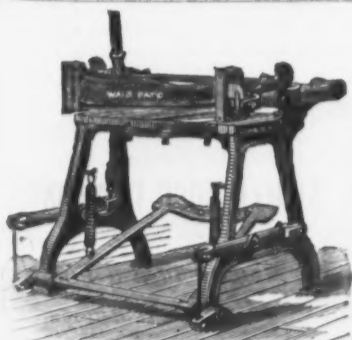
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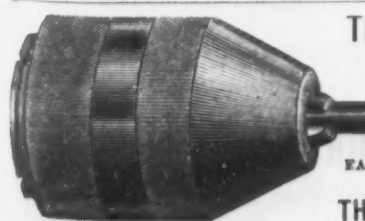
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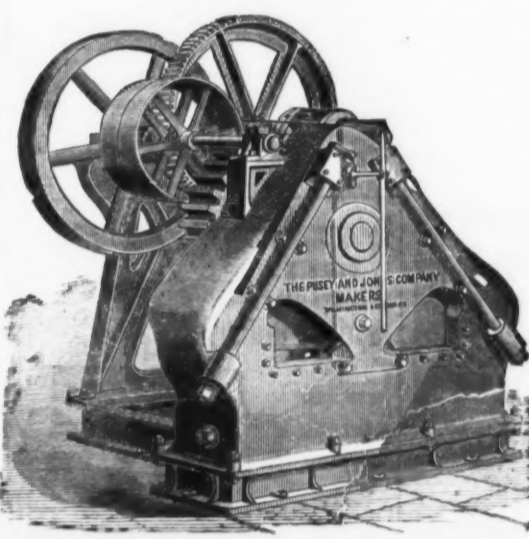
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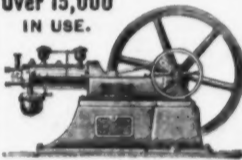
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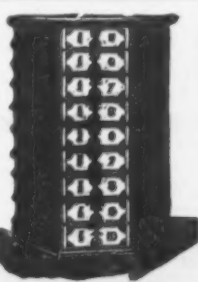
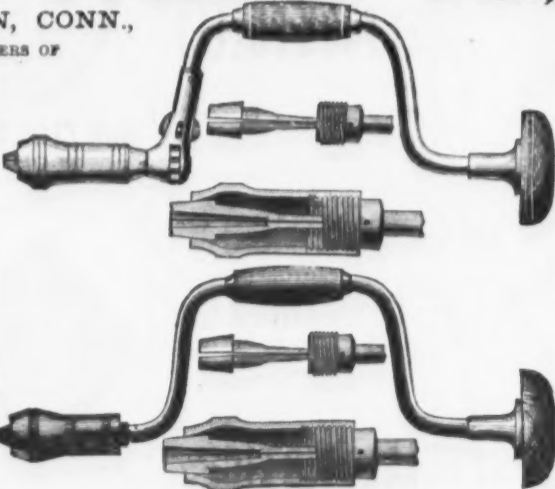
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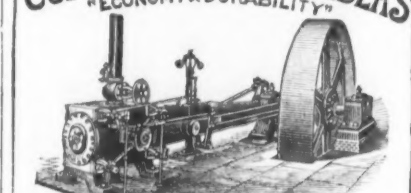
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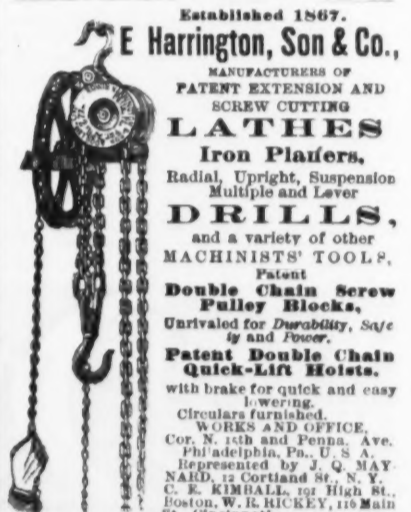
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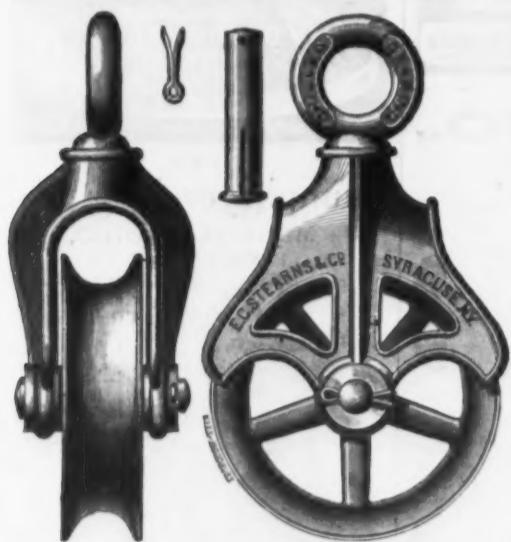
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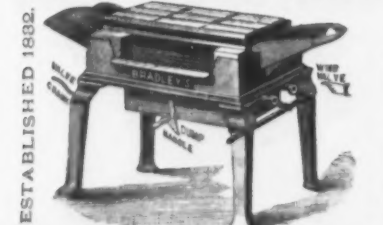


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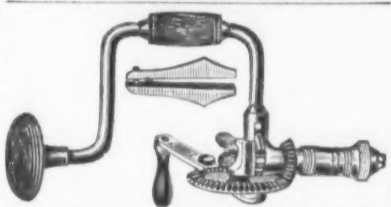
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This is one of our regular ten-inch Sweep Ratchet Bit Braces, to which a gear-wheel is added, making it serve the purpose of a Breast Drill. This wheel has cut gears and an extension handle. It is speeded about four to one, and can be removed in one second when not needed for drilling.

The Bit Brace is made of steel, highly polished and heavily nickel-plated, with a cocobola handle and lignumvitae head. It has two sets of forged steel jaws, which will hold square and flat shank tools of all shapes and sizes, and round twist drills from 7/16 to 1 1/2 inch in diameter. The ratchet attachment enables the Brace to be used in places where there is not room to revolve the sweep.

Many attempts have been made to imitate the outside appearance of our Barber Improved Braces, but no one dares to use our Patent Braces, as seen in this cut, and no brace is good without them. We guarantee these tools to be perfect in every respect, and that they will give great satisfaction to all who use them. Hardware dealers will furnish them on demand at our prices, or we will forward one by express on receipt of Three Dollars.

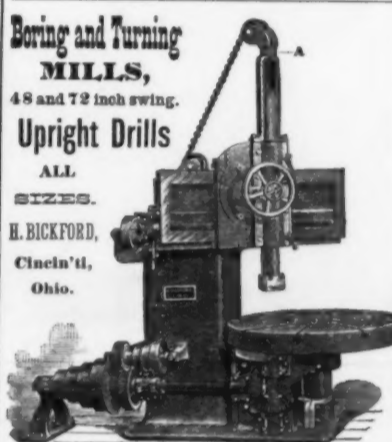
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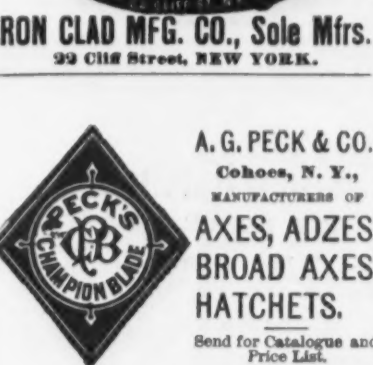
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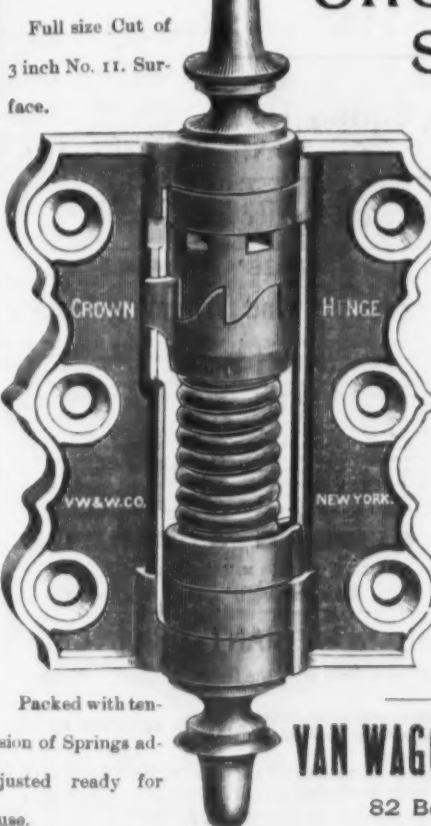
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